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Computer Weekly

Thursday, July 15, 1982

DJ "AI" to back solid state memory device

by Kevin Cahill
SOMERSET based DJ "AI", the backer of The Last One, are to finance another controversial project, the 9.9-gigabyte solid state memory device from Micro Xeno.

Birmingham based Micro Xeno last week announced that a "considerable" sum in advance royalty payments and goodwill investment had come from DJ "AI" in Los Angeles.

The payments will enable the company to fulfill orders placed by Plessey and Cifer, and to build a number of demonstration machines which will be shown to the public within the next few months.

The financing follows a protracted cash crisis at Micro Xeno which has led to the departure of a number of staff and a halt in production of the device.

The solid state memory, invented by Micro Xeno's chairman Bari Kahn, is a revolutionary application of coding techniques to the opportunities created by microprocessors.

Kahn has been developing the charged packet memory, as the device is called, for over three years, and has produced specifications which show that the machine operating at very high speeds will encode and decode 9.9 gigabytes of data in real time, and store the coding in just eight Kbytes of latch memory when the memory is switched off.

Details of the machine were revealed in a story in Computer Weekly on March 18 this year, and Kahn released a specification to the paper which has since been circulated to a number of experts.

The consensus view so far is that the device is revolutionary and uses principles which are untested

as yet, but which should work. Because of the cash crisis Kahn has been unable to make a device available for a complete test by external agencies, which he now hopes to do later this year using the DJ "AI" money.

A number of financial institutions have been to see Kahn but have not so far offered any finance. No financing institution has turned Kahn down outright, but most have simply adopted a "wait and see" attitude. Despite these setbacks, commonplace with new UK inventions, Kahn has persisted in his search for finance.

Ferranti at one time showed a significant interest in the project, but has lately withdrawn and declined participation in a BBC programme already made about the memory device.

The device, which could wipe out the magnetic disc market overnight if it performs according to specification, will now be built abroad.



KAHN... Persisted in search for finance.



Less than one sixth of R&D spending by MoD goes on pure research.

MoD speeds technology sharing

by Nicholas Rattick

THE Ministry of Defence is to speed up the process of technology transfer from military R&D establishments to industry. In pursuit of this aim it held a one-day seminar last week, discussing with senior management of some 40 large companies and financial institutions how this might be achieved.

The companies represented all sectors of industry, and included CAP Scientific, Cossor Electronics, Ferranti, Plessey Electronic Systems, Racal Electronics and Sinclair Research.

Ministry spokesmen said that two main messages emerged from the seminar. For the Ministry itself, efforts would have to be made to translate details of its developments into appropriate manufacturing and marketing terms, so that industry could more readily and accurately appreciate the potential of the opportunities open to it.

For industry, the message was that MoD inventions were not cloaked in a sheet of secrecy, but were available to British companies who thought they would be able to exploit them.

The initiative can be seen in the light of the present government's policy of reducing public expenditure as far as possible, and more narrowly in relation to the continuing debate on the defence estimates, which has gained a new lease of life since the Falklands conflict.

Defence R&D spending currently runs at £1,840 million a year, of which £300 million is pure research and £1,540 million development, meaning very largely the procurement of military equipment. The major spin-off from this expenditure at present is arms sales, currently running at £1,800 million a year.

Seen in this light, it will be realised that the new MoD policy does not mean an increase in re-

search spending. The Ministry came under some criticism, for example, for its laggardly approach to Ada developments. The Department of Industry has taken the lead in promoting joint Ada projects with industry, in contrast with the US situation where the Department of Defence has been the prime mover.

Ministry spokesmen held out no hope of a change here, saying only that negotiations about Ada projects were currently taking place but declining to give details or timescales.

Returning to the question of technology transfer generally, the Ministry claimed to have a good record on this. Spokesmen waxed lyrical on liquid crystal displays, carbon fibre composites and a host of even more esoteric products which had found their way into industrial products.

Univac's first relational system

by Kevin Pearson
SPERRY Univac has taken a lead in the mainframe stakes with its week's launch of the first fully fledged relational database system based on its highly respected IBM series operating system.

The company has also introduced a new top end, water cooled processor, the 1100/90.

The new relational database system is contained in the Universal Data System (UDS) 1100, and includes multi-user access for data access and updating, a common deadlock system to ensure integrity by providing lock-out multiple access.

The UDS system is of modular design, enabling users to select those parts of the system they actually need, the company says. It is compatible with all IBM mainframes, from the new 1100 downwards, and should be available in the second quarter of 1982.

The company's new processor takes Univac up to the 25 million instructions per second output in a tightly coupled four-processor system. It is Univac's first water cooled machine.

The architecture of the 1100 series has been extended to 1100/90 to 64 megabytes of real-time and up to 1,144 megabytes of real storage. Memory is implemented in 64-Kbyte chips.

The company announced at the same time a new disc subsystem, the 8480, with a capacity of 1.144 gigabytes. It can handle 100 series communications channels, level applications development tool. Both Advice and UDS are products.

Univac's first relational system.

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At the heart of the financial message system, can Swift be relied on?

Swift denies reports that 'personal' users can crack the system

by Kevin Pearson

ANYONE with a personal computer can penetrate Swift, the international banking money transfer system, according to allegations by an American magazine and US security consultants.

But Gunnar Stromberg, speaking from the Swift headquarters in Brussels, said the claims made in MIS Week, and statements by some US security consultants, were "rubbish".

According to Stromberg the Swift system has so many levels of control and encryption that it would not be worth anyone's while trying to crack the system.

"It would be far easier to go into a bank and crack the internal controls," he said.

The method outlined in the magazine is not based on anything more sophisticated than attempting to confuse staff in a receiving bank into accepting unverified messages at busy times.

This is done by intercepting and changing one letter of an incoming message at random, and updating the frequency of this event until the receiving bank gets used to the idea that there are transmission problems in the system.

Then on a Friday, as the bank is closing for business, in comes a bad message, but in the rush to

clear payments and knowing the system is error prone, a bank official makes the requested payment rather than lose interest over the weekend.

"I think this scenario would work," says Bob Jacobson, head of New York consultancy International Security Technology.

Swift, the Society for Worldwide Interbank Financial Telecommunications, accomplishes its goal reliably and economically, and has done a good job, Jacobson adds. But, in the year since Swift was set up by a London-based consultancy, capability and dropped in price. Swift has not done an assiduous job of keeping up, Jacobson said.

"Swift's security is actually very good," said Harry Wood, a former FBI computer expert and head of security consultants Wood Butko Kemp and Partners in Fairfax, Virginia. "The weaknesses are in the banks themselves, not within Swift internally."

"Often, bank wire rooms and their security and technology are not what they might be," Wood added. "Swift could not be expected to act as a policeman for all its users," and many large banks have taken or are taking steps to impose a higher standard of security."

On a Friday, as the bank is closing for business, in comes a bad message, but in the rush to

Telecom sale to be 'major election issue'

by Our Parliamentary Correspondent

OVER half of British Telecom is to be sold to the public after the next election, if the Conservatives stay in power. The government published its White Paper this week on how it intends to sell off BT in one or more blocks to the private sector.

A statement in the Commons on Monday by Industry Secretary Patrick Jenkin was greeted by the immediate opposition of Shadow Labour Minister Stan Orme, who said the sale of the State-owned asset would become a major election issue.

Jenkin said he believed that BT freed from government constraints would be a new expansionary force in the market.

BT was already leading the information technology revolution in the UK and could become a major world force, he said.

But Orme protested loudly at the government's plans and said the Labour Party would fight to maintain a national telecoms network under public control of BT.

A more cautious reaction came from BT itself. A statement from the board said they had not been consulted about the decision, but the Secretary of State had promised full consultation on the implementation of his proposals.

Until details had been made

known the board could not express any general view, but they would seek to ensure that the changes led to BT having a stable basis for its future development, opportunity to compete fairly in the market, serve its customers well, and safeguard staff interests.

The statement said that, given the right conditions, the board of BT would welcome freedom from the web of government control and interference.

In his Commons statement Jenkin also announced that he intended shortly to issue a general licence permitting all bona fide value added network service operators to use the BT and Mercury networks.

The way was now opening for the private sector to sell telephone apparatus directly to the public.

BT's charges had risen steeply recently while investment was still not enough, Jenkin went on. Unless something was done radically to change the capital structure and ownership of BT and provide a direct spur to efficiency, higher investment would mean still higher charges for the customer.

The government, BT and the public would find it unacceptable. There was a need to free BT from traditional forms of government control.

BT would be subject to proper market disciplines and would be in

a position to provide services more responsive to customer needs like those by privately owned companies in the US, Jenkin said.

Licensing will also be reformed so as to end BT's exclusive privilege and there will be a new Office of Telecommunications, modelled on the Office of Fair Trading, under a director-general appointed by Jenkin.

The Office of Telecommunications, "to ensure that everyone, including BT, plays to the rules of the game," would be set up by May, 1984.

Enabling legislation will be put before Parliament in November.

JENKIN... "A need to free BT from traditional forms of government control."

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NEWS BRIEF

US spying charge is dropped

THE US Justice Department has dropped charges against one of the Mitsubishi employees indicted recently in the "Japcom" industrial espionage case.

One federal attorney in San Francisco, where the charges were brought, indicated that the charges against Tomizoh Kimura had been dropped because Kimura might not have known he was engaging in illegal activities.

Sord shares sale

JAPAN'S No 2 micro company Sord Computer Systems, is making a limited sale of its shares on August 20 at £140 for the nominally £1 shares. This is the highest price ever paid for a stock in Tokyo. Sord, which will open its UK offices in August, has two American venture capital financiers and one from the UK involved in the issue.

Boost for ME29

ICL's ME29 range is set for a major boost with the release of a new version of the TME operating system which will do away with the need to use the antiquated and inefficient 2903 job control language for the running of programs.

DEC connections

VIEWDATA specialist house Aregon yesterday announced a new gateway product, IGS-1, to provide links to national networks for Digital Equipment users. Aregon already has five orders for its new system from companies in the US, Italy and the UK. Cost of the system, which will provide connections to X25 network protocols, is £15,000.

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Thatcher speaks for science

by Our Parliamentary Correspondent

THE government's top person for science and technology is to be Prime Minister Margaret Thatcher.

She announced her new duties last week in the House of Commons in response to a recommendation by the House of Lords Select Committee on Science and Technology that a minister should be specially designated by the Prime Minister to speak for science and technology.

Thatcher said that issues may arise which straddle the responsibility of several ministers to such an extent that it would not be sensible to ask any one of them to take the lead.



THATCHER... New duties.

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Travel agents all at sea

by Andrew Thomas
TRAVEL agents are baffled when it comes to using computers, says a report from the Travel Associations' Consultative Council (TACC).

Keith Hunter, chairman of TACC's working party on computer/technology matters, says there is a pressing need for unbiased technical advice on system choice. The individual agent is generally confused by the competing claims of manufacturers.

"With little technical knowledge on which to base a decision, a significant number of agents is admitting defeat," says Hunter.

TACC reports that travel agents are still using computer aids only for the provision of information and that there is still a long way to go before the technology is widely used for ticket issue and reservations, internal accounting and administration.

Between a third and a half of UK travel agents have some form of computer installation, the most common being Prestel.



ACKAD... Does not qualify for legal aid.

High costs could put paid to shift leader's 'unfair dismissal' case

by Andrew Thomas
SACKED in March for allegedly exceeding his authority as a shift leader, Ralph Ackad took his employers, Glaxo Operations UK, to an industrial tribunal, claiming unfair dismissal. But he now finds that the wheels of the British legal system grind exceedingly slowly, and could cost him a great deal of money.

Ackad was employed at Glaxo's Greenford headquarters for five years and part of his responsibility was to monitor invalid attempts to access the online systems running on three Hewlett-Packard HP 3000 machines. The standing instructions to the three shift leaders were to log each invalid password warning appearing on the console and to notify the operations manager if more than three were encountered with any one terminal. Seeing six warnings appearing in quick succession, Ackad disabled

the terminal in question by means of a command which, according to site procedures (written by Ackad), should only be used by authorised personnel. He then telephoned the department in question to investigate.

"Those procedures are written for the guidance of operators," Ackad said. "Shift leaders should use their initiative."

Glaxo operations supervisor Christopher Neathey, himself an ex-shift leader, disagrees. At the hearing last week he stated: "Operators should follow orders. It's not part of their job to question or change instructions."

Neathey also claimed a poor work record for Ackad, including lateness (the longest time stated at the hearing was 13 minutes), suspect quality control, and "behaviour not expected of a shift leader." This last statement refers to an incident where Ackad was

signed off work by his domestic partner, who was a member of a social club one evening.

"The doctor told me to say I was not at work," Ackad comments.

Neathey berated Ackad for being "over-cautious" in dealing with jobs falling outside his remit, and went on to state that he should not use his initiative in the matter of the invalid password incident which led directly to his dismissal.

At the end of the two days scheduled for the hearing, Glaxo counsel was only half-way through the evidence of the second of five witnesses, and Ackad has to take the stand.

The tribunal adjourned the hearing until September 8 with little progress having been made. Ackad, who does not qualify for legal aid, claims that the case has already cost him £1,000.

US confiscates 'Soviet-bound' hardware

by Howard Karten
THE US Commissioner of Customs has seized some \$400,000 worth of computers in West Germany, charging that the hardware was set for shipment later to the Soviet Union.

As of last Thursday, many details of the case remained murky. The Justice Department, apparently wishing to keep a low profile, would not comment on the case.

Customs Commissioner William Von Raab said that the seizure on July 6 had been a joint operation of US, Canadian and German agents. He added that 466 seizures had been made, part of the Reagan Administration effort aimed at stopping the transfer of high-tech

hardware with potential military applications.

Apparently MLPI Business Systems of Toronto, Canada, and Phoenix, Arizona, exported four DEC minicomputers for a West German client.

The computers were seized in West Germany, according to news reports, where they were allegedly awaiting trans-shipment.

Glen Langdon, president of MLPI, was quoted in news accounts as saying that the systems were made in 1975 and thus of little or no military or strategic value.

Computer Weekly's efforts to reach Langdon, or either of his offices for comment, were unsuccessful.

ICL networks pioneer joins Computervision

by Boris Sedacca
FOUNDER of ICL's telecommunications networking strategy, Gordon Peake, has found a new home.

He has joined Computervision, one of the world's leading manufacturers of computer-aided design and computer-aided manufacturing equipment, as European services and support manager.

IPA is ICL's answer to IBM's System Network Architecture. "Having sold it to two successive ICL managing directors, Chris Wilson and Robb Wilmore, it became something of an anti-climax," said Peake.

"It is now nothing more than a giant development cycle and it is up to Wilmore now to see it through. You don't market IPA - it is too abstract, a way of life. As a project it will never be quite finished, like SNA which is a never-ending saga."

Peake says he was approached with an "exciting proposition" from the company. "I know nothing about CAD/CAM, but I know the world's number one supplier so I thought it would be a good idea to join them."

Peake's new responsibilities will cover software development, including the communications element of Computervision's Graphics Network Architecture.

"The job demands an understanding of a number of areas like engineering, architecture, building construction and printed circuit board design and my job is to employ specialists in these areas so that, for example, an architect will talk to an architect," Peake said.



PEAKE... "IPA a way of life."

Go-ahead for Citibank

by Howard Karten
THE Federal Reserve Board, a government agency charged with supervising and regulating US banks, last week approved a three-year-old request of Citicorp to enter the data processing and data transmission business.

For three years Citibank, one of America's five large commercial banks, has sought permission to provide the services to its customers and other banks. The bank has been opposed in its efforts primarily by Adapeo, the Association of Data Processing Service Organisations, representing firms which

also supply DP services. Citibank is a large DP user and has developed a considerable body of in-house expertise.

Federal Reserve Board regulations limit the scope and nature of non-banking activities in which banks and bank holding companies can engage. The FRB ruled that Citibank, through its new subsidiary to be called Citicore, must limit its DP activities to "banking, financial and economic data."

Adapeo said it was likely it would appeal against the FRB ruling.

French technology centre brings computers to the Third World

THE shroud concealing the activities of the mysterious and controversial Centre Mondial has been slightly lifted by Danny Hillis, a speaker at SPL's Fifth Generation conference who is working at the centre on secondment from MIT.

The centre was set up to fulfil a commitment of President Mitterrand, who declared at last year's Sicoob exhibition that France would be establishing a world centre for computing development as soon as possible. Its major objective was to be the sharing of

computer technology with Third World Countries.

To translate this ideal into reality, Mitterrand appointed a team of control consisting of a number of prominent French politicians under the chairmanship of Jean-Jacques Servan-Schreiber. It is Servan-Schreiber's ideas in his book *The World Challenge* which are controlling the efforts of the Centre Mondial.

Here he proposes that the world's poorer nations can escape from poverty to capitalising on

brain power rather than by building and producing physical objects. He argues that Third World nations can pass straight into the information and service era, given the right means, without passing through industrialisation.

To implement this view, however, Servan-Schreiber has called on the services of another visionary, Seymour Papert, who is known for his work in fifth generation-type natural language systems and has also written a book, *Mindstorms*.

In this he proposes that every child should be given a terminal at an early age as a vehicle of personal development.

Papert's fifth generation proclivities have been emphasised by the appointment of MIT professor Nicholas Negroponte as director general of the centre. Negroponte comes from the MIT Artificial Intelligence Laboratory, as do Hillis and a number of other workers at the Centre Mondial.

Another luminary at the centre is microcomputer specialist Allen Kay, seconded from video games pioneer Atari. Technical innovation is thus at least as important an aspect of the centre's activities as its social and political motivations.

Unlike other French research centres, the Centre Mondial is sponsored directly by the Pres-

ident and reports directly to him. It operates completely independently of bodies such as INRIA, CRNS and SERC, and has had minimal contact with these and other relevant bodies. As a result, it has aroused considerable disquiet, not to mention professional jealousy.

Hillis has now given some details of the Centre's activities. In one project, the Centre is providing technical help to a mass movement in Marseilles, France, which aims to give everyone over a certain age their own computer.

Marseilles hardly qualifies as the Third World but a similar project is taking place in the former French colony of Senegal. Children from varied backgrounds and economic classes there are being given personal computers as soon as they reach school age. Parallel projects are taking place in a curious mixture of other places, ranging from Boston to Arabia, Geneva to Japan and California to India.

"The ideal is to make children as familiar with computers as they are with tables and chairs," explained Hillis. "Those of us born before this age have missed out - computers will always be to us as automobiles were to my generation. The older generation views information technology as a corruption, not a tool."



"The older generation sees information technology as a corruption."

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French urge end to US domination of data flow

by Jack Gee

THE French government has called for urgent action to prevent IBM's coding norms being given international acceptance, in order to curb US domination of data flows between countries.

The appeal was made in a government report on cross-border data movements by Alain Madec, a Ministry of Industry official. Madec stressed that users of the IBM data code were required to identify themselves to the State and Defence Departments in Washington.

The report also emphasised that, with increasing data traffic between nations, a government's economy, defence and even its citizens' survival were at the mercy of a breakdown of computer operations on a big scale.

A political crisis or act of terrorism which interrupted the flow of data or enabled secret information to be transferred to a foreign power could leave a country powerless said Madec. The situation could lead to economic warfare comparable to a blockade or trade embargo, he added.



RAISON... "Wide-ranging consultations."

Special rules for medical records - Minister

REGULATIONS providing special protection for medical records may be needed when action is taken to implement the Government's White Paper on data protection, Timothy Raison, Minister of State at the Home Office, told MPs.

He reported that wide-ranging consultations, including the medical profession, are still taking place.

Rene Short (Lab, Wolverhampton NE) wanted to know whether the regulations on computerised personal health records would cover manual systems; and whether applications by the police for information to be made available to them about an individual's personal health data would only be agreed to after the patient's consent had been obtained.

Raison said the government's proposals applied only to personal data processed by automatic means. It would not be in the interests of effective law enforcement to place a statutory requirement on data users who made information available to the police for the purposes of the prevention or detection of crime to seek the subject's prior consent.

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Curtain goes down on costly UK mistake

by Kevan Pearson
THE costliest blunder in British software saw its final stage last week when Insac, the taxpayer-funded scheme to sell UK software in the US, was closed for good. The company had looked like going down since the sale of its American subsidiary in November 1981 to the California company Briton-Lee.

Insac was set up in 1978 with £20 million from the now equally defunct National Enterprise Board. Its purpose was to promote and sell British software expertise overseas, particularly in the lucrative American market.

But Insac never had the full support of the British software industry.

The company ran into serious problems within two years, when in 1980 both SPL and Systems

Designers, originally members of the NEB fold, and suppliers to Insac, were sold off into private hands, and subsequently terminated their agreements with the company.

Within 18 months the company had lost the products of two of its other major suppliers, Altergo, producer of the Shadow teleprocessing monitor, and Corodale, an American company which had no business being handled by Insac at all.

Serious doubt as to Insac's longevity was cast in early 1981, when the NEB delayed over approving its new five-year plan which called for additional government-funded investment.

The final blow came when Insac was sold to Briton-Lee, and any hope of its pursuing its original intentions was irretrievably lost.

The demise of Insac does not mean that British software is unsuitable for the overseas market. On the contrary, there are many notable examples of British export success — BIS's Midas banking system, and Micro Focus' CIS Cobol, for example.

So just where did Insac go wrong? Firstly, it was not equipped to match the high pressure sales techniques of the American software industry and spent next to nothing on advertising. Then, it did not have the right people in the US leading the sales effort. And there were problems with suppliers, with behind-the-scenes accusations and counter-accusations about Insac's sales efforts and the suppliers' support for Insac.

In short, Insac never really had a chance.

US software house pulls out of UK

by Robert Parry
US software house Professional Software, originator of the WordPro series of word processing packages for Commodore Pet microcomputers, has pulled out of the UK. Its wholly owned subsidiary in Pottery Bar has shut, and distribution of the software is now handled by Wego Computers in Caterham.

Wego was one of the 100 or so dealers selling Professional Software products as retailers, and "became quite involved with the products and with the manufacturer," says Wego's sales manager Geoff Duck. WordPro is second runner in the Commodore word processing field, behind Wordcraft which has a firm hold on the market.

When Wego heard that Professional Software was looking to change its UK marketing arrangements, it approached Professional Software in the US and put itself forward as a potential distributor.

"It seems the US manufacturer now prefer distribution to its own operation," comments Duck. Professional Software started casting around for other means of selling its products about four months ago, after the managing director of the UK arm, Bob Webb, left to become distribution sales manager for Commodore Electronics. The departure of one of the sales team a month later strengthened the move to appointing a distributor.

"There are problems for a US company selling into Europe," says Webb, "particularly in reaction time. The UK is very demanding of its software, and dealing through a distributor often leads to much better relations. A distributor can make more demands on the manufacturer."

Webb reckons the change will definitely improve the Professional Software product, which as well as lagging behind Wordcraft is threatened by new word processing packages coming on to the market for Commodore machines.

In addition to handling WordPro, Wego will distribute Power, programming tool kit firmware for the Commodore range. It is a Commodore dealer, and sells hardware from Apple and California Computer Systems. On the software side it also has a range of modules it uses to put together bespoke applications packages for Commodore systems.

BTG £230,000 in academic prizes

by Kevin Cahill

LAST week was bricksbats week at the British Technology Group, following the publication of the annual report, and losses. But this looks like bonanza week with the BTG handing out £230,000 in prize money for a series of commercial developments produced as a result of academic research.

The prize-giving ceremonies, in London, produced a crop of well engineered, marketable products from a range of institutions, mostly universities.

First prize of £50,000 went to a team from the University of Southampton led by Professor William Gambling and Dr D. N. Payne, who developed two instruments for use in optical fibre communication product manufacture. Via a company they have set up, York Technology, the two academics have successfully built and sold £250,000 worth of the equipment, mostly abroad, since the beginning of last year.

The key computer industry winner was Professor Martin Healy's 16-bit distributed network computer built by Future Technology Systems of Beth, Ayrshire. The machine based on 8088 and 8086 microprocessors, was up and running for the award winning ceremony and has been adopted for sale by Travel Systems for their Association of British Travel Agents software.

The system is a move away from shared logic architecture, according to Healy, and gives the user much more powerful shared function capabilities based on a single piece of hardware.

Professor Healy set up Future Technology Systems in conjunction with Peter McHugh and David Shear. Since its inception in 1980 Future Technology Systems has involved itself mainly in building its own machines, but is now building for the OEM market and other "own brand" customers, according to Healy.

Two other computer-based application devices won awards of £10,000 each. One is a Smart Arm robot designed by George Carter of the University of Durham and built by Systems Control of Thornaby, Cleveland. The Smart Arm robots are small, low-cost, and driven by easily programmable software to enable tasks to be varied.

Professor Michael Hampshire and a group from the University of Salford won £10,000 for a single card computer control system for application to low volume machinery, to be produced by a University of Salford research company called PMH Electronics. The competition, staged over two years, attracted 118 entries, 99 from universities and 15 from polytechnics.

Europe misses the boat on North American videotex standards

by Donald Kennett

EUROPEAN industry has been missing an important opportunity to influence North American standards for videotex (viewdata and teletext) through the American National Standards Institute's videotex working group X3L2.1.

Since April the group has been holding joint meetings with an equivalent Canadian working group to develop a draft proposal for text and graphics character codes to be adopted as standard for both countries.

The draft is called the North American Presentation Layer Protocol Syntax (PLPS), defining its relationship to the international standard setting body for communications, CCITT.

European interests seem to have stayed away under the misapprehension that the meetings were closed to foreigners. Present development chief Keith Clarke said:

"Whenever we have turned up at their meetings the Teldion lot and the AT&T lot have kicked up a terrible fuss."

Canadian Standards Association meetings are closed to outsiders, as are those US meetings specifically designed to arrive at a national position for international discussions — such as this week's CCITT group meeting. But US telecommunications lawyer Gary Rosch, hired by British Telecom and CEPT (the European subset of CCITT) to represent the European joint videotex standard in US discussions, said that making a fuss about European participation was a competitive move by rival interests rather than a ruling by ANSI. "US telecommunications is a very cut-throat business," he added.

The result has been a draft proposal which does not relate well to the European standard, according to X3L2.1 chairman Tom Hastings of Digital Equipment. One of the two sets of control characters is completely different, the graphics scheme includes the

by Philip Hunter
SENIOR managers must learn fast about expert systems, or the UK will fall further behind its competitors. This is the message from the British Computer Society specialist group on expert systems, which recently spent a weekend preparing a campaign to promote awareness in companies and government.

The BCS will express its urgency at a management tutorial on expert systems in September. "We won't be talking to them in our jargon, we will be talking to them in English," promises Alex d'Agaapeyeff, chairman of the BCS group.

There will also be a three-day technical conference at which several leading US expert systems people will speak. One of these is Edward Feigenbaum of Stanford

University, who recently spoke at SPL's Fifth Generation conference in London.

The BCS is concerned that expert systems have a bad name in the UK and as a result are being neglected in our companies. "Artificial intelligence has a bad image in the UK, and people deride anything derived from it," says d'Agaapeyeff.

The BCS is also concerned at the small number of skilled people in expert systems in the UK and urges government investment to reverse the brain drain that is taking away senior people capable of directing projects.

One speaker at a recent BCS meeting thought that this would not come easily "since we are faced with an inflexible, innumerate government bureaucracy which unfortunately thinks it knows what it is doing".

Reorganisation at Scicon

A MAJOR reorganisation has taken place at Scicon, Britain's largest computer services company. It reverses the separation of the bureau operation in Milton Keynes from the London-based consultancy arm, which was a major feature of the group's last reorganisation in 1978. Now the two activities will be run together as Scicon UK.

Scicon UK will form part of a

new larger grouping, Scicon International, reflecting the size of the group's overseas operations, which now account for about three-quarters of its overall revenues. This follows the acquisition last year of Systems Control Incorporated of California for about \$10 million.

The changes reflect a greater commitment by Scicon's parent company, BP, to information technology.

Canadian idea of "picture definition instructions", which are not used in the European standard, and the remaining character sets are similar but not identical.

In Hastings' view joint work could be done on a way of translating between the North American and European schemes and it would be possible to "harmonise" two of the character sets — the mosaic graphics set with accented characters. But it is too late to bring about a re-write of the whole draft.

In Rosch's view, however, this is just a very preliminary draft. "I don't think the time has passed for action," he said last week. "If European manufacturers sit on their hands at this stage the result will be quite inevitable, but it doesn't have to be."

The X3L2.1 group's brief was to produce a draft videotex standard for North American use. It is to be considered this summer by the next committee up, X3L2, as just one of a number of coding schemes for different purposes. In the autumn it will be considered by the X3 committee, which will have to wrestle with the fact that it is different from the European standard.

SALES BRIEF

Norweb network deal goes to ICL

MAJOR ICL user Norweb (North West Electricity Board) has bought five ICL ME29s on the strength of the distributed processing capabilities of ICL's IFA (Information Processing Architecture) networking scheme and its growth plans for the ME29. A bid from IBM was also considered.

The systems will be used for standalone local processing in four area offices initially and networked for the exchange of goods and maintenance files in the second phase of a two-year project.

CAD for Vickers

CAMBRIDGE Interactive Systems has won a £230,000 order from Vickers' mechanical engineering projects division for a computer-aided design system based on its Medusa software. The system will run on a Prime 550 mini with four Tektronix-based graphics workstations and a Benson plotter. Its purpose will be to help produce a wider range of designs during the tendering process and to ease draughting administration procedures.

Case contract

ONE of data communications company Case's biggest orders for message switches has come from British Telecom International. Worth £600,000, the order is for Case's MSX-T series systems to improve the handling of international telegrams and the overnight Telemessages which have replaced inland telegrams.

£2m orders

ADP's Onsite service, in which a small mainframe is installed on the customer's premises but software and networking are provided by ADP, has attracted expansion orders from BL Systems and British Telecom. Renewed orders have been placed by Allied Breweries and Bass and there is a new order from North-western Regional Health Authority. Orders placed in recent months total over £2 million.

Stock control

DATA Logic has won a contract to develop an order processing and stock control system for lubricant supplier Burns Castrol's UK manufacturing and distribution network. Each depot will have a 128 Kbyte Data General CS30 mini with a 12.5 Mbyte or 25 Mbyte Winchester disc drive and other peripherals.

£1m exports

FERRANTI has won two export orders from undisclosed countries for tactical display systems totalling over £1 million in value. One of them includes a three-colour screen more than three metres square as well as a large number of conventional displays. The other is for a 128 Kbyte Ferranti Argus 700 minicomputer. This type of Ferranti display system is now used in the countries in North America, Europe, Asia and the Middle East.

Shops automated

MOTOR parts and accessories chain Halfords has placed an order worth over £100,000 with UCL Microsystems for 300 16Kbyte MS5P programmable portable terminals and two data receivers. The terminals will be used to collect and order information in branch shops.

140 mins

AN order worth £2 million for 140 Wang minicomputers has been placed by an engineering company. Wang sold 250 of the 2200 LVP minicomputers in the last year, so the single order is a welcome boost to its new quarterly figures.

Michael Aldrich David Britton Phil Dorn Joseph Engelberger Mrs Steve Shirley Chuck Peddle

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Legal threat to disc supplies is settled

by Kevan Pearson
THE legal case which threatened to hold up supplies of the largest capacity disc drive so far announced has been settled out of court in the US.

Storage Technology and Ibis Systems have ended their legal actions against each other, and Ibis will now distribute its five-gigabyte system which was originally scheduled for late 1982.

This was set up late in 1981 and staffed largely by STC employees, 13 of whom were named in the STC action alleging breach of contract on the part of the Ibis. It was also alleged that Ibis had misappropriated STC's trade secrets.

This filed a counter-claim alleging unfair competition by STC.

Last week the parties announced that they had reached a mutually acceptable agreement.

Ibis has undertaken to make an undisclosed cash payment to STC, and will not hire STC or ex-STC employees unless they have been out of STC's employment for at least six months. Some of the 13 employees will not be allowed to work on particular types of product development.

An independent agency will check on development work at Ibis to see that the terms of the agreement are not breached.

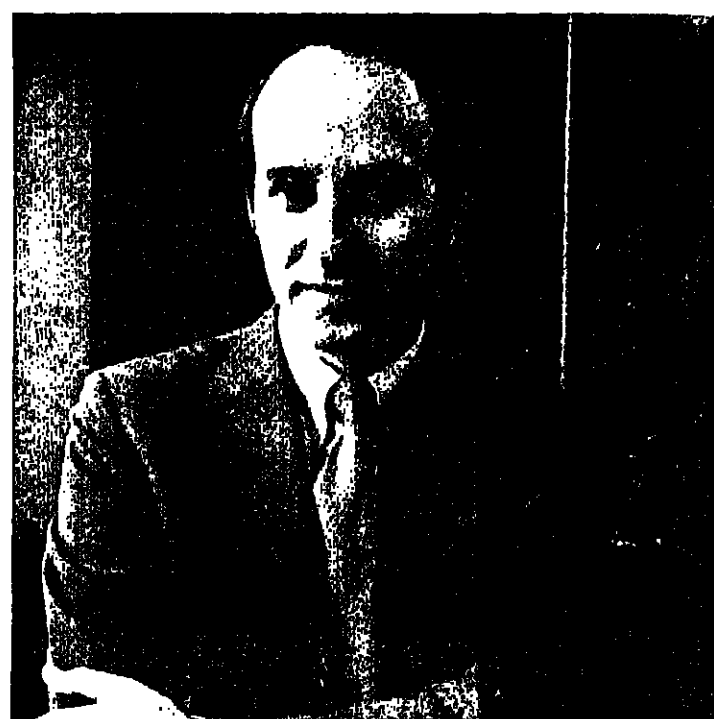
For its part STC has agreed to drop all legal actions against Ibis including the alleged patent infringement, which threatened to hold up supplies of the Ibis 5000.

Ibis' products including systems

smaller than the 5000 system will be distributed in the UK by Fee, a London-based software and hardware distributor. Alan Leibert, Fee managing director, says Fee expects to handle \$9 million worth of Ibis products in the first year of operation. Fee will handle both OEM and end user sales for Ibis.

Ibis uses a method of recording different from the other contenders in large disc market. Most of the companies in the field have followed IBM's approach with its 3370 and 3380 products using thin film heads and conventional ferrite coated discs. Ibis is using thin film discs with conventional read/write heads.

This approach has caused a lot of interest in the industry.



LEIBERT... "Fee expects to handle \$9 million worth of Ibis products in the first year of operation."

Phone bill increases held down

by Donald Kennett
BRITISH TELECOM has proposed a package of price changes that it says will add an average of 3.3% to all telephone bills after November.

In the autumn it plans to announce increases of up to 33% in the cost of leased lines to take effect from next February. But these were previously expected to go up by 50%, a spokeswoman said.

Part of the need for adjustments is to match charges against costs, to meet competition from Mercury and other services. Profits from long-distance calls and subsidies on local ones are both being reduced and BT has long said that leased line charges were held unrealistically low by price freezes in the 1970s.

Computing Services Association director-general Doug Eyelons said that leased line charges were a long-term problem that would have to be solved in the long term.

The call charge increase he said, were relatively modest. "What is far more important is the lack of progress in liberalisation, which will bring price reductions through competition."

Telecommunications Users' Association secretary Michael Corby said it was worrying that full de-



EYELONS... "Lack of progress in liberalisation."

tails of leased line charges were excluded from the package for no apparent reason. It was also interesting that BT was considering offering bulk discounts on international leased lines to meet competition from abroad but was unwilling to concede the principle for inland links.

Viewdata in business project

by Donald Kennett
A SCHEME to promote the application of viewdata in business is being launched by Langton Information Systems with backing from Sony, ICL, Prestel and the Department of Industry.

Senior consultant John Mitchell says Langton plans to approach up to 500 companies to find 30 which will be prepared to go ahead with suitable viewdata trials. They will be offered consultancy from Langton, unspecified support in cash and kind from the backers, and a co-ordinated exchange of experiences with each other through user groups, seminars and reports.

Mitchell hopes that the scheme, called Fave, will speed the acceptance of viewdata by making more managers realise that it can be an effective tool, especially in association with office automation.

"We see the scheme moving a lot of equipment because the value of viewdata to business is not at all appreciated and yet it is there," says Mitchell. "Top management demands its information on a piece of paper because it cannot relate to a DP screen. But viewdata can provide an interactive flavour to information a manager deals with directly without involving any intermediaries."

Euro-law to give equal pay to freelances

by Nicholas Enticnap
FREELANCES will enjoy the same pay and conditions of employment as permanent staff as of right in 18 months time, if a draft directive just published is accepted by the European Council of Ministers. The proposed legislation will place a number of restrictions on the way freelance agencies operate.

The new Euro-law has been proposed following a substantial growth in temporary working throughout the EEC. Many of these temporary workers are paid substantially less than their permanent colleagues, have little protection against dismissal, and are not entitled to benefits such as year-end bonuses and paid holidays.

The new legislation will require temporary workers to be paid at

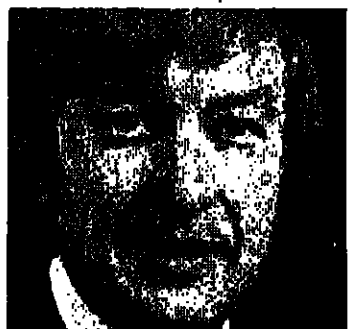
least as much as permanent staff and to enjoy the same working conditions. This will be documented in a written contract issued to each temporary worker for each assignment.

The driving force behind the law is the finding that many companies are using the high unemployment levels throughout Europe to employ successions of temporary workers and so evade their obligations under employment protection legislation.

These abuses do not in general apply to freelance computer professionals, but they will nonetheless be covered by the law.

For example, agencies will not be allowed to prevent a temporary worker taking up permanent employment with a company at the end of his or her contract. Any such clause in a contract would be considered null and void.

The legislation is unlikely to have a big impact on temporary working in the computer industry, but it may well cause some irritating administrative problems. A typical reaction came from Vic Groves of VNG Professional Services, who said, "We're going to come up with some difficulties. The fundamental problem is that contracts are between companies, while the legislation is aimed at the individual, and it's difficult to make the two compatible."



GROVES... "Difficulties ahead."

Paper will pile up in the office

by Nicholas Enticnap
HOPES (or fears) that paper will rapidly disappear from offices are unfounded. New electronic communications systems will not begin to have an impact on paper use at least until the 1990s, and some of them will have no effect before the next century.

This is the major finding of a market research study published by International Resource Development (IRD) of Connecticut. The study is called "Paper-based electronic mail", and costs \$1,285.

The study predicts a growth in messages sent via electronic communications systems and delivered on paper. IRD calculates the figure for 1982 at less than four billion, and predicts 20 billion for 1992.

Systems covered under this general heading of "paper-based electronic mail" include telex, teletex and facsimile.

The finding is in line with the results of other research. In a report published last year by BIS Marketing Research, for example, it was recorded that overall paper consumption in the UK was growing at a rate of two per cent a year. The use of paper in business alone is growing at twice that rate.

NEWS BRIEF

Profits 50% up at Altergo Software

IBM systems software house Altergo Software has reported profits up 50% on turnover up 30% for the year ended March 1982. Overseas activities are expected to be increasingly important in the present financial year, and Altergo has strengthened its US subsidiary in Boston.

Two more European offices are due to be opened soon.

Services tie-up

TO cater for the specialised accounting market a new company has grown from a tie between the Fraser Williams computer services group and the City of London chartered accountants Hacker Young. The new company, called Hacker Young Fraser Williams Ltd, will operate out of Fraser Williams (London).

Higher fees

MEMBERSHIP fees for the Institute of Data Processing Management (IDPM) will go up on January 1, but the increases are by less than the current inflation rate. The new fees, approved at last week's annual meeting are £26.50 for a full member, £20 for an associate member and £18 for both affiliate and licensee members.

Tandy buoyant

PRELIMINARY sales figures from US microcomputer and consumer electronics giant Tandy for the fiscal year ended June 1981 show a rise of 20% over the previous year. Total sales were a record \$2,031 million compared to \$1,691 million for fiscal 1980. Sales in June were up 24% over June 1981, at \$174 million.

Canadian sell-off

NEW YORK-based Advanced Computer Techniques has started moves to sell off its Canadian subsidiary ACT Computer Services. Under an agreement with the Canadian government Foreign Investment Review Agency, the company must try to divert just of at least 60% of the equity to Canadian investors. The subsidiary has projected 1982 revenue of \$8 million (Canadian).

More of Mimi

MIMI range of business micro-manufactured by British Aicom, is now more widely available following the appointment of over 20 UK dealers spanning the country from Inverness to the Isle of Wight.

Prize system

THREE months after winning a DEC Robin computer in a computer simulation competition for schools, The Lycée Français in London has taken delivery of a prize. The £4,000 system comes with a lifetime service contract.

Diablo distributor

RAPID Terminals of High Wycombe, has been appointed distributor for Diablo Systems. Rapid will supply the full range of Rapid wheel printers from Diablo. The Diablo products fulfil Rapid's requirements for a range of high quality printers to complement its DEC dot-matrix printers already carried.

10,000th drive

US disc manufacturer Prime has delivered its 10,000th Winchester disc drive. The eight-inch, 35-megabyte unit went to microcomputer manufacturer Prime. The disc drive is part of a range of 14-inch and eight-inch drives running at \$80 million a year, and it has just brought out a 20-Mbyte 5 1/4-inch unit.

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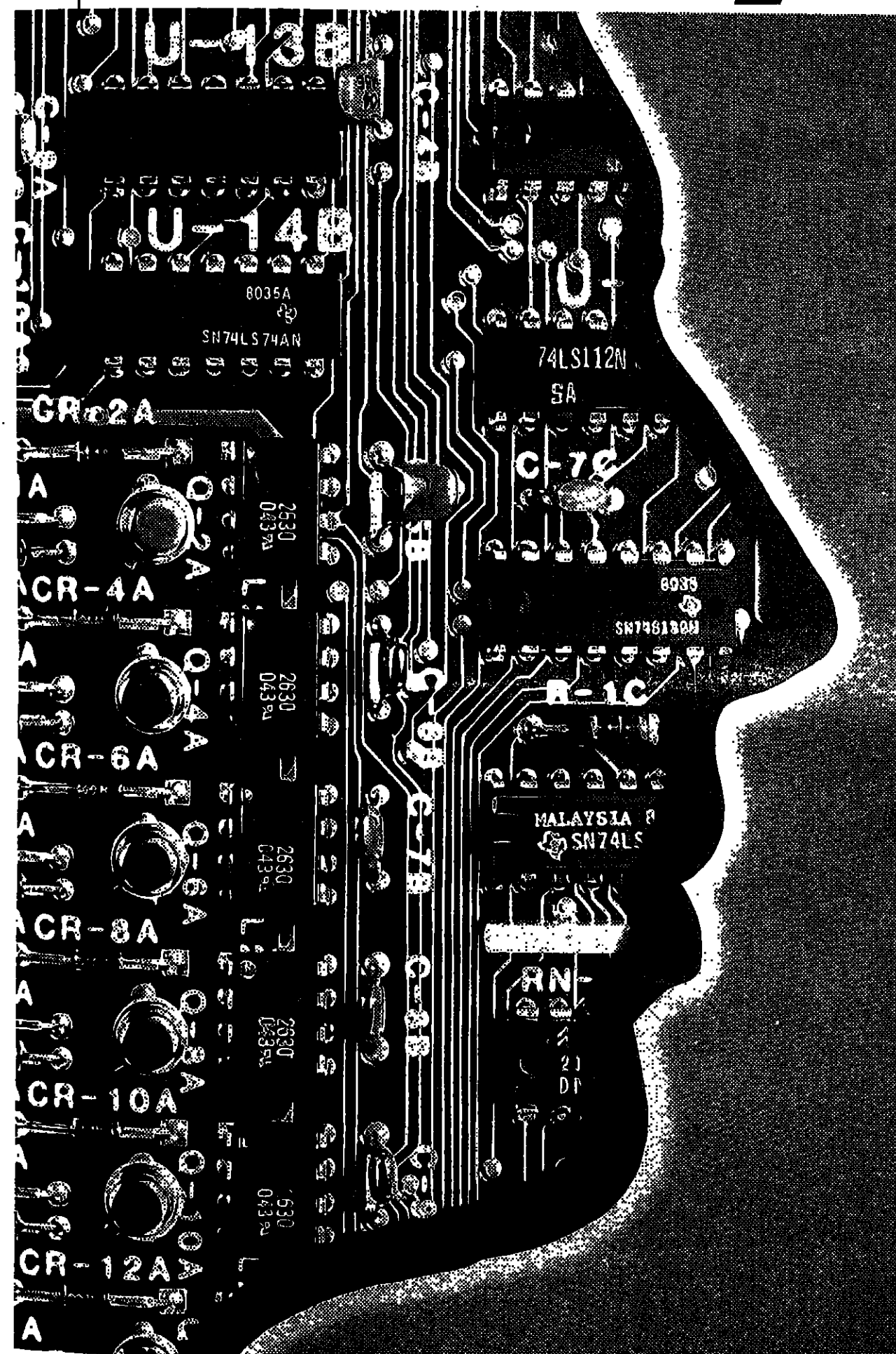
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Machine Intelligence

In more ways than one, human intelligence and judgement are being built into software. Predictions from time series data, games strategies, pattern recognition... we look at these three examples of "intelligent" programs in our August issue, out now.

We review the Televideo 802 (a hard disc computer for businessmen), and the Sharp PC 1500 (a pocket micro for engineers and scientists).

And we examine stock control on an Apple and a portable version of the ever-popular Invaders game.

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Practical Computing

German govt bales out AEG Telefunken

by Kevan Pearson

THE decision last week by the West German government to grant the troubled giant AEG £140 million in loan guarantees gives the company much needed breathing space, but its long-term survival depends on much wider issues.

The government granted AEG loan guarantees both on specific export orders and for its manufacturing activities, contingent on the company's bankers coming up with a further £64 million.

Although some of the 24 members of the banking consortium which owns 50% of AEG's equity may be unwilling or unable to extend any further help, it looks as though AEG will achieve the necessary amount.

The two amounts together should ensure the company's financial survival, at least to the

end of the current financial year, but they will not solve the long-term problems which have brought the group to its present state, with losses totalling £500 million over the last four years, and world-wide debts of £1.1 billion.

The long-term survival plan depends on splitting the diversified electronics and industrial group in two parts, and attracting financially strong partners to help bear the costs of turning the business round to profit once more.

One part would comprise the potentially viable capital goods, electronics and telecommunications sectors, in which the British General Electric Company has shown a considerable interest.

The other part would be AEG's heavy loss-making domestic appli-

cations operations.

GEC is reported to be willing to pay up to £180 million for a 40% stake in AEG Technik, as the capital goods section of the new company would be called. And Lord Weinstock, GEC's chief executive, has held several rounds of talks with AEG and its workforce.

However, the talks have so far foundered over the issue of managing AEG's unions fear that GEC's involvement would result in heavy job losses, and have attempted to find another way of securing the company's future.

The unions had managed to arrange talks with the Bonn government to discuss the possibility of the government taking a direct stake in AEG. However, the economics minister, Count Otto Lambsdorff, said there was no possibility of this.

Water cooling no problem—Univac

by Kevan Pearson

SPERRY Univac does not anticipate any problems over the introduction of its fastest, most powerful computer system, despite its use of water cooling, which caused ructions for IBM users when that company introduced it on its largest processors in the early 1970s.

Charles Williams, vice-president of Univac's international division, said that the company estimated the cost of converting to water cooling for users would be between \$20,000 and \$40,000. This compares with the cost of the computer system itself of between \$2.8 million and \$9.6 million.

Williams added that Univac would not have liked to have been the first company to introduce water cooling, and probably would not have done so had IBM not educated the market to it.

The only problem which could occur, he said, was that a computer room might not be in an ideal site for the introduction of chilled water—for example, above the first two or three floors of a high-rise building.

The introduction of water cooling on the 1100/90 series was necessitated by the density of the logic circuits, which are 10 times as dense as those of the previous top of the range 1100/80.

Williams said that all the main-frame manufacturers would have to switch to water cooling as they introduced more powerful machines.

The 1100/94, a tightly coupled four processor system, delivers about 25 millions instructions per second—roughly equal to Fujitsu's M382, which ICL will market as Atlas 25. The M382's twin processors are cooled by air forced through the stack by large fans.

It seems likely that this is as far as air cooling can go. Gene Andahl has gone over to fluid cooling for the next generation of machines he is designing for his new company, Trilogy.



BAKER... Under fire in Commons.

'Lamentable progress' in public purchasing

By our Parliamentary Correspondent

INFORMATION Technology Minister Kenneth Baker has had to field Commons criticism of "lamentably slow progress" in the use of public purchasing to boost the introduction of automation systems in UK industry.

The Minister reported that under the Department of Industry's robotics programme grants over £2.6 million had been approved. He also announced last month a new £35 million Industry Act scheme to assist the introduction of flexible manufacturing systems.

This would supplement £25 million available under the Science and Technology Act 1965 for a continuing programme of related research and development.

The maximum grant had been raised to one-third to stimulate companies to action this year.

Gwyneth Roberts (Lab., Cannock), still insisted despite the DoI efforts, progress was "lamentably slow". He asked Baker to remind his fellow Ministers in the government that major technological investments would take place

only when the purchasing power of the public sector and of the economy generally was greatly increased.

Baker did not necessarily agree with the last point. He suggested that investment in manufacturing could be stimulated by other means, as the schemes already announced were showing.

The robotics scheme and the small engineering firms investment scheme had been a great success, he said. He was sure that the flexible manufacturing scheme would be equally successful.

A North-east MP, Derek Foster (Lab., Bishop Auckland) said that the flexibility of manufacturing had been so great in his region that many companies had gone out of existence. He asked if the Minister was aware that the new industries and the magnificent revolution in entrepreneurship promised by the government had led to a net job loss in the North.

Baker said Foster's general thesis was that firms should not automate because it led to the loss of jobs. He had refused that argument on many occasions.

Cliff Dilloway on Employer's Guide to Statutory Sick Pay

The biggest change to payroll systems since 1975 is coming

THE Employer's Guide to Statutory Sick Pay is now being distributed. It is well written and needs to be studied by all those who have responsibility for modifying payroll systems.

Statutory sick pay calculations are still required for employees who are nevertheless paid in full when off sick. The precise amount of statutory sick pay can be recovered against national insurance contribution payments, and proof has to be available to show that at least that much has been paid to employees.

There are three aspects to statutory sick pay: the administrative, to determine whether the employee is entitled to sick pay; the calculation, to work out how much the employee is entitled to for the number of days he has been sick; and the record-keeping, to provide the information needed the next time the employee is off sick and to report at the year end.

There is little help that the computer can give with the administrative arrangements of determining whether an employee is entitled to statutory sick pay. Judgments as to whether an employee's notification of sickness absence was late without good cause cannot be made by the computer, any more than the system could decide whether the evidence of sickness was adequate.

Clerical procedures will determine the days or dates on which an employee was not able to work, and the days and dates on which he should have worked and didn't. The two are not the same, and studying our definitions will show that the first is a "period of incapacity for work" (PIW) and the second, "qualifying days".

From the days and dates of the PIW and qualifying days the computer can take over. The calculations are complicated enough for us to wonder how we would have coped without it. There are three weekly rates of statutory sick pay, and which one is applicable depends on a moving average of earnings over the last eight weeks.

The daily rate of statutory sick pay is the weekly rate divided by the number of qualifying days in a week. From the definition you will see that the number of qualifying days in a week can vary from employee to employee—but note that they always occur as whole days for statutory sick pay purposes.

Statutory sick pay is paid for all qualifying days in a PIW after the first three, which are waiting days. The PIW has to be at least four

days long to count as such. More than one such PIW with fewer than fourteen calendar days between them are treated as one PIW for waiting day and average earnings assessment purposes.

The statutory sick pay payment should be identified on the pay slip. The payment is not additional to any other payments the employee may be receiving, but is a minimum payment.

Showing that the minimum entitlement has been paid is essential to avoid queries. Whether as a specific payment or part of a large payment made for other reasons, statutory sick pay is recoverable from the government.

The method of recovery is to deduct the amount from national insurance contribution payments before they are made to the Collector of Taxes. For this reason, statutory sick pay has to be reported in total employee by employee on the P35 at year end and brought into account in recording the total taxes due.

The computer system can keep a watch for two actions, necessary when an employee approaches the limit of his statutory sick pay entitlement in a year. After eight weeks measured out in weekly fractional qualifying days an employee becomes entitled to the

sickness benefit we have always known, paid by the DHSS. During the seventh week of statutory sickness a transfer form has to be completed and given to the employee so that he may claim sickness benefit. The computer can keep track of employees as they approach the limits and trigger the necessary actions.

Most employers will wish to keep records of employees' sickness absence in excess of the requirements of the DHSS, if they have the welfare of their employees at heart. The legal minimum of records is the dates of sickness absence with a note of why statutory sick pay was not paid on any of those days. The details of qualifying days in each PIW also have to be recorded.

Employers have to maintain a satisfactory control mechanism over sickness absence and if they seek DHSS assistance in investigating the health of employees with a number of self-certified sicknesses in a year, then rather more information will be required. Computers can usefully perform a monitoring function and the expansion of personnel systems in that direction is to be expected.

This is the biggest change in payroll systems since 1975. May all your system alterations flow smoothly.

Statutory Sick Pay = $\frac{\text{Weekly rate of SSP} \times \text{Days SSP due}}{\text{Qualifying days in week}}$	
Statutory Sick Pay liability in a tax year ceases with the day when the sum below exceeds eight (8).	
Sum for all SSP payments	$\frac{1}{\text{Qualifying days in week}} \times \text{Days SSP due}$

Figure 1. Statutory sick pay calculation formula.

Period of incapacity for work (PIW):	
At least four consecutive days during which an employee is not fit enough to work. The days do not have to be working days.	
Linking:	PIWs separated by 14 days or less are linked and count as one.
Qualifying days:	The days on which an employee would have worked had he not been sick. By agreement almost any arrangement can be made as to what constitutes qualifying days, but if no work is scheduled and there is no other agreement, Wednesday must be taken to be a qualifying day.
Waiting days:	The first three qualifying days in a PIW. Linked PIWs count as one PIW when counting waiting days.

Figure 2. The terminology

SOFTWARE FILE



SELL... There never can be a universal language.

Fifth generation effort is hampered by language controversy

by Claire Gooding

BRITISH researchers are strongly divided over the choice of language to spearhead UK research on the fifth generation of machines. The range of views expressed at the SPL London conference on the fifth generation proved how far Britain is from a united push to develop tools for the 1990s.

Japan has standardised on one language, Prolog, whereas the UK has settled for three languages including Prolog and Lisp. That makes the Japanese three times stronger," said Prolog expert Bob Kowalski of the Imperial College of Science and Technology.

Kowalski reported that the University of Tokyo had already implemented Prolog on 24 microprocessors using the artificial intelligence technique of parallelism. This mimics the way the human brain simultaneously processes masses of information (as with vision), rather than one piece at a time.

"If this had been done in the West there would be a lot of papers published," said Kowalski. "But there are no references in the Japanese JIPDEC publications, and

there is a reluctance to share information. We are only just starting to meet the Japanese at conferences."

Peter Sell of SPL International's UK research centre, disagreed that the Japanese had a great advantage in choosing Prolog above other languages. "Frankly, I'm astounded at the argument about different languages. There is not, and never can be, a universal language, and I would argue about the value of being restricted to one language."

"Like all tools, some are good for particular jobs. It's just as stupid to talk about banning hammers and nails in favour of screwdrivers."

One of the arguments put forward by Sell was that people are bound to disagree on the value-based judgements that will inevitably be "written in" to languages which are used to converse with users.

"Users tend to be more capable than designers realise. But current computer languages are too low-level for people and too high for machines, which is why programmers earn so much." Sell envisaged that current com-

puter languages will continue to be used with fifth-generation interfaces appearing as add-ons to present systems.

Larry Harris of Artificial Intelligence Corp in the US stressed the importance of giving people tools that they are happy with as part of making them want to use computers. Harris sells the Intellect language, an English-like tool based on his earlier research with the high-level Robot language, and is deeply concerned in making artificial intelligence marketable.

"People don't spend \$69,500 on something if they don't feel that they are going to get value out of it," he said. "It is amazing how the tension and frustration people feel about using computers dissolves when they sit at a terminal and use a language they understand."

"They experience enormous elation at feeling comfortable and in control. The top-level people, particularly older managers, become happy once they recognise that they are working with data they've known for years. The trick is to convince them that it's no big deal working with computers."

Advertising Authority backs Cincom critics

by Philip Hunter

LARGE UK software house Cincom Systems has run into trouble with the Advertising Standards Authority (ASA) for making a misleading comparison between its software and IBM's.

Two members of the public complained about the phrase "CPU Utilisation 181% better", which was featured in an advertisement that ran for three months in a UK weekly computer publication.

The figures were supposed to compare the speed of Cincom's own database management system and the one available from IBM. They exaggerated the difference, claimed the complainants, by stating the performance of Cincom's system as a percentage of IBM's.

A fairer comparison would be achieved, they said, by stating the

IBM performance as a percentage of the Cincom one.

On that basis Cincom's performance would be 100%, and IBM's 55%, an improvement for Cincom of 45%.

ASA upheld the complaint, and Cincom has promised to change the figures before using the offending advertisement again. "We admit the figures were misleading," says UK Cincom general manager Terry Booth. He points out, however, that the general point made was correct. "It was based on an independent German benchmark," he says.

IBM declined to comment on the affair since it was not directly implicated. A spokesman said that IBM never indulged in comparisons designed to denigrate the competition.

Viewdata to database converter

by Philip Hunter

THE world's largest software conference will come to London in 1985.

The International Software Engineering Conference has accepted an invitation made by the London Convention Bureau, LCB, offered 14 possible venues, including well-known conference centres such as Wembley, and other sites such as the Festival Hall.

The LCB is an agency of the London Tourist Board, and is always on the look-out for international conferences.

The next of these international software conferences, which are held every 18 months and last three days, is scheduled for Tokyo in September. The application of software techniques to the as yet mythical fifth generation compu-

Major conference to come to London

by Philip Hunter

ter is expected to feature prominently there.

The UK's representative on the international committee that organises the software engineering conferences is Manny Lehman of London's Imperial College.

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ter is expected to feature prominently there.

ATTENTION

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SOFTWARE BRIEF

ICL launches productivity tools

ICL has developed a set of software tools to aid programmer productivity. The first announcement is TP Easybuild, an addition to Data Dictionary System, which allows users to build their own teleprocessing service in response to questions from DDS. ICL is also launching a series of Applications Blueprints used in conjunction with DDS to cut application development time by up to 90%.

Protocol handling

HONEYWELL UK has announced protocol handling software for DRS 6 and Level 6 minicomputers to operate within an IBM System Network Architecture environment.

Financial modeller

COMSHARE has announced a CPM-based financial modelling package called Planmercator selling for £39. A more sophisticated system called Masterplan adds features for consolidation and interface with word processing systems.

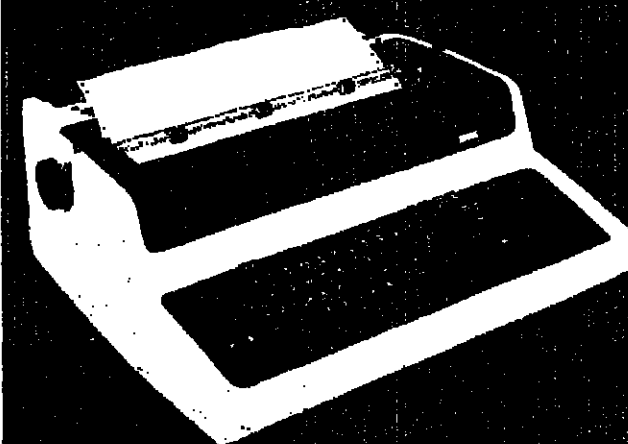
Protects software

TABS has developed a software protection mechanism which operates through the serial RS232C interface port on microcomputers.

Dealers sought

BUG Byte, a Liverpool-based consumer software supplier which claims to have sold more than 500,000 cassette games since the firm was set up two years ago, is looking for more dealers to supplement its existing 90 dealers nationwide. "Our target is 500 within the next 12 months," said director Tony Baden. Contact 051-227 2642.

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MICRO NEWS

Report tips micros to move in on non-stop systems market

THE minicomputer-dominated world of fault-tolerant computer systems for online transaction processing systems is facing a micro challenge. Established market leader Tandem, with its NonStop systems, is being challenged by a growing list of competitors who are after the valuable high integrity system market. All the newcomers use designs built around microprocessors, particularly the Motorola 68000 and Intel iAPX432.

The benefits of moving to microprocessor-based designs are discounted by Tandem, according to a report on fault tolerant systems from California technology watcher Icom International*. But Icom feels there are significant advantages in using the new breed of 16/32-bit microprocessors.

"Tandem is faced with the classical trauma of a mini maker trying to break out of the 16-bit mould, a process most leading mini suppliers went through about 10 years ago," says Icom president Omri Serlin. He sees the internal 32-bit architecture of the 68000, which most of the newcomers are

using, as a significant advantage. There are price considerations too, according to the report. A design from Tandem Computer - a thorn in Tandem's flesh - which incorporates self-checking would be economically out of the question with Tandem's minicomputer approach, says Serlin.

Stratus featured recently in a legal action brought by Tandem to stop Stratus publishing allegedly misleading product comparisons and using the term NonStop, a Tandem trademark.

Tandem is using 68000s, but only in peripheral controllers and not in the CPUs. The CPU logic accounts for about 4% of the cost of a typical Tandem system, and is, claims Serlin, shackled to its 1974 vintage architecture by the huge investment in proprietary software.

The report suggests that some Tandem customers are already chafing against the limits of that architecture, an idea rebuffed by Tandem's UK managing director John Louth. "In a recent survey in Datamation Tandem was rated highest for customer satisfaction. There were zero complaints."

He also sees the argument against the old - "well tried" he prefers - 16-bit architecture as a red herring. "We changed processors about 18 months ago and are taking advantage of hardware improvements like 64K RAM chips. The software has not changed at all, despite a move from 16-bit addressing to 32-bit. The architecture may be old and proven, but the implementation is an evolutionary concept."

Some of the microprocessor-based hardware coming on to the scene will use the Unix operating system - supported on the 68000 - modifying the internals to run on the fault-tolerant hardware while leaving the user interfaces intact.

This would appeal to users familiar with Unix - which is fast becoming a standard operating system for high performance 16-bit microcomputers - and would permit the use of third party applications software.

Icom's study suggests that this approach would allow new entrants to the arena to bypass the time-consuming and expensive task of developing such software from scratch - a process Tandem is counting on.

Intel's iAPX432 chip set is well suited to fault tolerant systems because of its functional redundancy checking feature which would ease self-checking designs. Growth of such systems is also helped by the 432's self-despatching multiprocessor capability, and its object oriented architecture is well suited to developing fault-tolerant software.

But widespread use of the Intel device will not happen until the price of the chip set comes down substantially, says Serlin. He also reckons that software support and family range must improve dramatically, and that the product line needs to be seen to be more determinedly supported by Intel.

Things are moving on that front though, and Intel has announced its intention to integrate the instruction decode unit and micro-execution unit chips on to one.

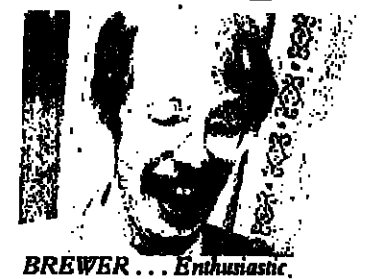
The market for fault-tolerant systems will grow to nearly \$22 billion by 1986, the report says.

*Fault Tolerant Systems Study 822. Icom International, PO Box 1415, Los Altos CA 94022, USA. \$995.



LOUTH... "Zero complaints" from Tandem customers.

Apple picks Zynar for new office



BREWER... Enthusiastic

THE UK arm of Apple Computer, settling into its new nest in Hemel Hempstead, is installing a local network to streamline its office operations. Kit for a 20-station network has been delivered by Zynar - leading contender in the Apple network stakes, and the network should be in operation in two weeks.

Zynar, now majority holder in

American company Nestar, which developed the Cluster 1 network system, sees the deal as important for both Zynar and Apple. "It gives Apple a significant tool for Apple to use themselves," says marketing manager Roy Sheridan, "and we are pleased with it."

Apple's marketing manager Stephen Brewer is enthusiastic about the idea. He reckons it will speed things up considerably around the office.

Technology exchange

A FIVE year cross-licensing and technology exchange agreement has been signed by Intel and NEC dealing with a single chip microcomputer and various peripheral controllers. The aim of the agreement is to ensure direct compatibility of devices already mutually second sourced or under development by the two companies, so that the parts are interchangeable in customer designs.

The devices concerned are Intel's 8022 microcontroller and NEC's 765 floppy disc controller, 7201 multiprotocol serial controller and 7220 graphics display controller. The NEC parts appear as the 8272, 2874 and 82720 respectively in Intel's versions.

As part of the agreement, Intel will licence and give NEC update information to maintain compatibility on two other peripheral chips, the 8253 programmable counter timer and 8259A programmable interrupt controller said an Intel spokesman.

Rockwell in Seeq licence agreement

PROCESS technology and product design information from Seeq Technology, active in the electrically erasable PROM field, is to be licensed to Rockwell's electronic devices division.

Rockwell is also likely to second source Seeq's 16K EEPROM and its 64K UV erasable PROM, production deliveries of which are scheduled by Seeq for the autumn. Rockwell plans to offer samples early next year, moving to full scale production in the second half.

The agreement also includes Rockwell's right to use Seeq's non-volatile memory circuit design and process technology, with continuing assistance from Seeq, says Rockwell electronic devices division president Al Lapiere.

Sperry deal

US computer company Sperry is to be supplied with 64K dynamic RAMs by Japanese manufacturer Mitsubishi Electric. A long-term supply contract is due to be concluded this month for quantities thought to be around 30,000 units a month.

This is the first deal under a collaborative arrangement set up early in June by the two companies. Mitsubishi will also develop and manufacture custom LSI circuits to Sperry's specification.

To meet this quantity order, Mitsubishi is to raise its monthly output of 64K DRAMs to one million units by September.

Q-bus array

AN ARRAY processor to DEC's Q-bus has been introduced by Massachusetts-based Sky Computers. SKYMNK-Q - a fast floating point processor for technical and scientific computer users in applications like radar, speech recognition and robotics.

The unit, on two VLSI chips, is based on a 1.5-1.2-0.123-0.012-RT-11, RSX-11 or VAX-11. It is claimed to speed up operations by transforming by between 50 and 100 times that of a standard microcomputer. The price is \$6,000.

COMPANY NEWS

Documentation firm goes public on USM

by Philip Hunter

ONE of Europe's leading suppliers of technical documentation is going public later this month to raise money for acquisitions. Shares in Intereurope Technical Services will be up for grabs on the United Securities Market (USM) founded for companies too small to be able to afford a full Stock Exchange quotation, which can cost £250,000.

According to chairman David Immanuel, whose family owns most of the company, the decision to go for a quote now was triggered by a need to offer senior managers shares. About £4.8 million worth of shares is expected to be sold.

Immanuel says that Intereurope did not go for a full quote now partly because that would cost

more, and partly because the company does not at the moment wish to release the full 25% of its share equity necessary to do this.

Intereurope supplies technical documentation to many leading computer companies including ICL, GEC, Ferranti, and Racal as well as the Ministry of Defence, for which it is also an approved supplier of software.

The company diversified into software and communications last year, a move which accelerated the rate of growth with profits rising from £274,000 in 1978 to £650,000 in the year ending June 1982.

So far ten computer companies enjoy quotations on the USM, including Scandata, Zygol and Tri-data. Usually a listing on the USM precedes a move onto the full

Stock Exchange, which Intereurope's top men expect it to do.

Intereurope produces documentation by sending its people over to liaise with the technical staff of the company concerned, and return with the raw information to produce their goods. In some cases a team will stay on site for some time if constant exchange of information with the development programmers and analysts is required.

Last year Intereurope built on the experience gained of software from its documentation activities to move into communications systems. It now has a fast growing team of analysts at its Wokingham office working on several projects, including a system to aid in the design of ships.



(left to right) Intereurope's David Immanuel, chairman; Edward Vallance, joint managing director; and Antony Dee, deputy chairman.

Funding conference success

The First Time Financing conference run by Computer Weekly and Barclays bank three weeks ago has led to three financing deals worth over £175,000.

Details of the financings will be formally released in the next few weeks, and at least one is expected to benefit from the Business Start Loan Scheme which Barclays formally relaunched last week.

This scheme, which has been used extensively by Barclays in its lending to the computer industry, was temporarily suspended because of a tax change introduced in the last Budget.

The change prevented Barclays treating the charge it made for the loan as franked income and therefore offsettable against the bank's own tax liabilities.

Formerly Barclays was able to

calculate its royalty charge on the basis of tax paid income, and this worked out at a real interest charge of about 12%, very much lower than current rates. The tax change means that the bank must treat the royalty as interest, and accordingly the royalty charge will now reflect an interest rate of about 17%.

However, the loan is attractive, particularly to software houses just starting up. First of all, there is a capital repayable holiday lasting for three or five years.

This means that one of the toughest problems faced by small computer companies, recurrent regular monthly payments in the face of erratic sales revenues, is eliminated.

The royalty payments do not start until the company has reached a certain level of sales, and

can be as low as 0.5% of the total sales revenues.

While not exactly an equity package, equity being straight investment in the company, the package comes very close to being just that. It also means that many small UK computer companies have access to neo-American type funding in their own high street.

This could lead to a substantial change in the pattern of UK computer company startups, according to some observers. With so much more startup funding available, many more software and other computer industry startups are likely to occur.

This in turn should lead to the kind of employment creation which has been seen in Silicon Valley, where more than 600,000 jobs in the computer industry have arisen from small company startups.

Japan trails in electronics market

ALLEGATIONS made by Alex d'Agapeyeff at the recent Fifth Generation Conference that the Japanese electronic companies have a dominant market share in Europe are flatly contradicted by a survey from consultancy Mackintosh International.

The survey, published by Ben Electronic Publications of Luton, shows the Japanese with just 3.7% of the European electronics component market, estimated to be worth £100,000 million.

Although a European company, Philips, has the single biggest company share at 11%, the Americans dominate with more than 31.5% of the overall market.

Pioneer strikes gold in California

by Philip Hunter

A UK software house has struck it rich in California with a large accounting and production control package based on Digital Equipment hardware.

Pioneer Computer Systems of Northampton has installed its Command system on a DEC PDP-11 in California, and has set up its first dealer there.

Pioneer hopes to have 40 dealers world-wide and 15 in the US by the end of the year. Director Tom McKaskill expects to make a million dollars in the US in the year from October 1982.

Pioneer will benefit from a Department of Industry market entry scheme during its first year of US operation. Under this scheme, the

government will lend a company half of the first year's costs of setting up a marketing operation abroad. These costs are then repaid out of royalties gained.

McKaskill says that this money was not vital to Pioneer, but will make the whole operation in the US proceed much more quickly.

The Command package is a big one, costing £40,000 in the UK, and just under £20,000 in the US. It is a menu-driven modular system based on database management software with ten optional modules including the usual range of ledgers, requirements planning and production control.

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CW SHARES TABLE

Data 18/7/82 Index 100.18 Change +1.41

Pence		London Stock Exchange		Parval		US Stock	
High	Low	Stock	Price	Chg	High	Low	Chg
170	168	Act (Amp Comp) (20p)	180	+2	204	174	+2
171	169	Act (Amp Comp) (20p)	180	+2	204	174	+2
172	170	Act (Amp Comp) (20p)	180	+2	204	174	+2
173	171	Act (Amp Comp) (20p)	180	+2	204	174	+2
174	172	Act (Amp Comp) (20p)	180	+2	204	174	+2
175	173	Act (Amp Comp) (20p)	180	+2	204	174	+2
176	174	Act (Amp Comp) (20p)	180	+2	204	174	+2
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187	185	Act (Amp Comp) (20p)	180	+2	204	174	+2
188	186	Act (Amp Comp) (20p)	180	+2	204	174	+2
189	187	Act (Amp Comp) (20p)	180	+2	204	174	+2
190	188	Act (Amp Comp) (20p)	180	+2	204	174	+2
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195	193	Act (Amp Comp) (20p)	180	+2	204	174	+2
196	194	Act (Amp Comp) (20p)	180	+2	204	174	+2
197	195	Act (Amp Comp) (20p)	180	+2	204	174	+2
198	196	Act (Amp Comp) (20p)	180	+2	204	174	+2
199	197	Act (Amp Comp) (20p)	180	+2	204	174	+2
200	198	Act (Amp Comp) (20p)	180	+2	204	174	+2

The table shows the closing prices on Thursday. The Share Index is based on the prices of the UK companies in the table. High and low prices are indicated in the table.

Shares traded on the United Securities Market under Rule 163(2)(a).

Index movement

Cable & Wireless set to back Mercury in attack on BT monopoly

by Boris Sedacca

RECORD profits at Cable and Wireless, the half government owned telecommunications company, have set the scene for an attack on British Telecom's monopoly.

The company is now in a strong position to put up its share of the initial £50 million capital investment programme in Mercury, a project to build an independent business communications network in competition with BT, scheduled to become operational early next year in London.

Mercury is 40% owned by Cable and Wireless. The other partners are Barclays Merchant Bank and British Petroleum. If demand for the new service takes off, the Mercury consortium plans to spend £1,000 million over the next 15 years in an ambitious network carrying domestic traffic and using satellite links.

Pre-tax profits of £97.7 million

at C&W were better than expected at the time the government sold half its holdings in the company, which had forecast a more modest £84 million.

Group turnover was £354.6 million, up from £293 million the previous year, and earnings per share rose 5.25 pence to 20.2 pence.

Indications that the impending battle between British Telecom and Mercury is about to begin came last week with the announcement that British Leyland boss Sir Michael Edwards would become executive chairman of Mercury.

Edwards's strong-man image is bound to boost Mercury's stature as a worthy adversary to British Telecom. Opposition to Mercury by the Post Office Engineering Union no doubt prompted his appointment, following his successful hard-line stance against the trade unions at British Leyland.

'Bigger than rest of world'

IBM still holds the leading place in the world computer marketplace, according to the Computer Yearbook recently published by the Japan Information Processing Development Centre in Tokyo.

The yearbook for 1982 is quoting figures for 1980, but the relative shares are not thought to have changed since then.

IBM has 42% of the installed base in general-purpose computer systems, which now number 164,890. The company also has a 56% share by value of general purpose computers sold worldwide.

The next largest market share by numbers, at 12%, consists of the entire contribution of the Eastern bloc, including Russia. This makes the Soviet Union and its satellites the jam in the sandwich between American companies. Honeywell made 10% of the world user base, followed by Burroughs with 5.2%, Univac with 4.2% and then a grouping led by ICL for which shares are not quoted.

Japanese companies, led by Fujitsu with 4% of the world-wide user base, made a total 7% world share.

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Freezing fog in July— thanks to a computer

WHEN your car breaks down, the failure is usually linked to the extremes of the weather. Either it is too hot (unusual in this country, I grant you), too cold, or too wet for your poor old jam jar.

If only the manufacturers could simulate these climatic extremes and subject samples of the car of your dreams to them before you hand over the ready, failures in the field, or even on the road, could be minimised.

Well now, thanks to the good old computer, operators can subject hapless motor vehicles to the most unpleasant conditions imaginable while luxuriating in air-conditioned comfort themselves.

BL's independent research company, BL Technology, has invested £16 million in new research and development facilities, which were opened last month, at Gaydon, Warwickshire. The installation includes the only climatic wind tunnel in the UK

motor industry, where any driving conditions can be simulated.

This wind tunnel accounted for half of the total cost of the new installation, and wind speed and humidity and temperature can all be controlled, accurately, and results collated and processed, by the computers which oversee all aspects of the tunnel's operation.

The climatic wind tunnel can accurately create temperatures from -32 degrees Celsius to +55 degrees Celsius, and wind velocities of up to 100 mph. Overhead sunlamps, heated floors, and variable fan shutters, all under computer control, can accurately simulate virtually any weather condition in the world.

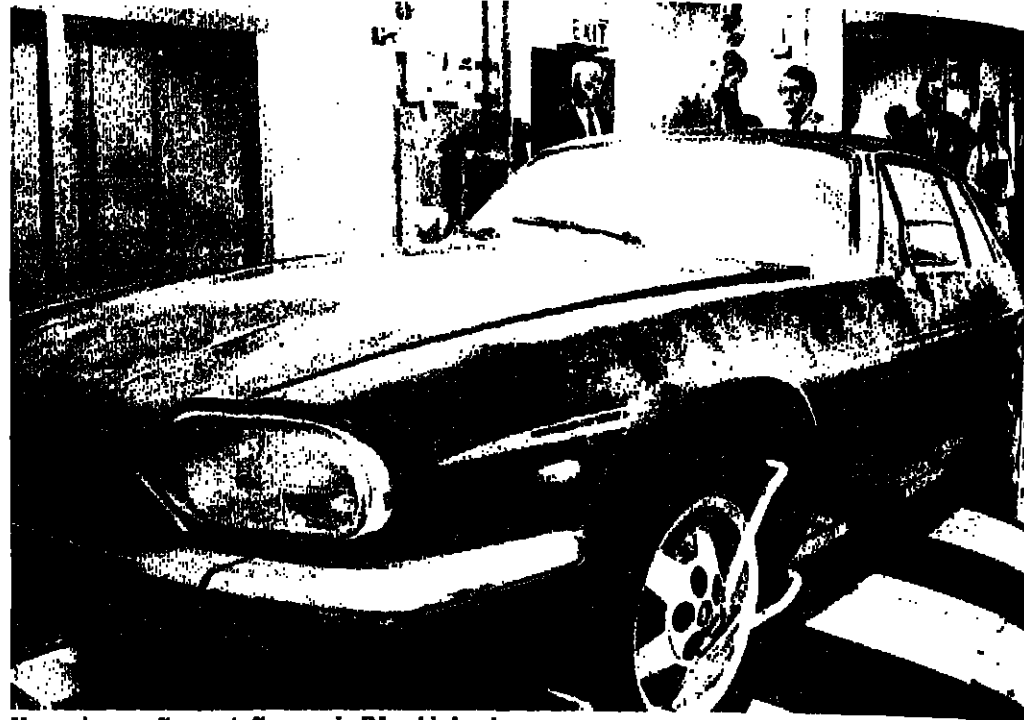
Cars and light commercial vehicles under test are extensively instrumented to gather statistics on temperatures, pressures, speeds and other parameters over test periods sometimes lasting weeks. With this length of test and the number of parameters recorded,

the number of results can run into tens of millions.

These results are collected by the Data Acquisition System (DAS), which builds up a complete database for each vehicle tested, and which can be processed at any time. This database is comprehensive, and will allow problems which come to light after the vehicle has been in service for some time to be resolved without further testing on another sample.

Conditions within the tunnel are displayed on a colour graphics terminal which gives the operators all the information they require on the tunnel's functions at a glance. In addition, the computer monitors various levels within the tunnel, such as carbon monoxide levels, and sounds an alarm should any personnel actually working on the vehicle under test be at risk.

A black box "flight recorder" is provided within the system, for quick analysis of the reasons for a failure of the car under test.



How to ice-up a Jaguar in June — the BL cold chamber.

One of the principal requirements of the tunnel was that it should be user-friendly, in that the operators should not need any programming experience to use it effectively. All functions are menu-driven, allowing data to be processed and presented in a

variety of ways without recourse to additional software.

The DAS runs on a DEC PDP-11/44 under RSX-11M using discs with tapes for archiving. The data itself is channelled through a DEC industrial I/O subsystem with 192 analogue channels, 112 of which are thermocouple channels, six counter channels plus a 16-bit digital data highway for both input and output.

The tunnel itself is controlled via two microprocessors under the control of the PDP-11/44, and the tunnel operator is kept informed of tunnel conditions by a Hewlett-Packard 2648. In addition to the graphics terminals, there is a Versatec printer/plotter providing hard copy of the pictures on the VDUs.

All the applications software has been written in Fortran IV Plus by BL Systems, and involved five man-years of effort from design to commissioning.

But the climatic wind tunnel is only one of the facilities at the Gaydon centre. A separate cold chamber can provide temperatures as low as -40 degrees Celsius.

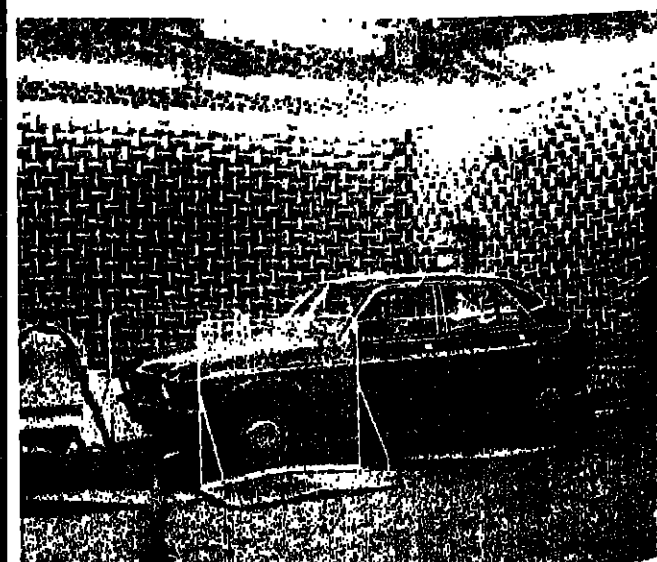
Both the climatic tunnel and the cold chamber are equipped with chassis dynamometers, allowing the cars on test to be run at any

thing up to full power inside the tunnels. The cold chamber can also provide a most unpleasant freezing fog which tests cold car performance to the utmost.

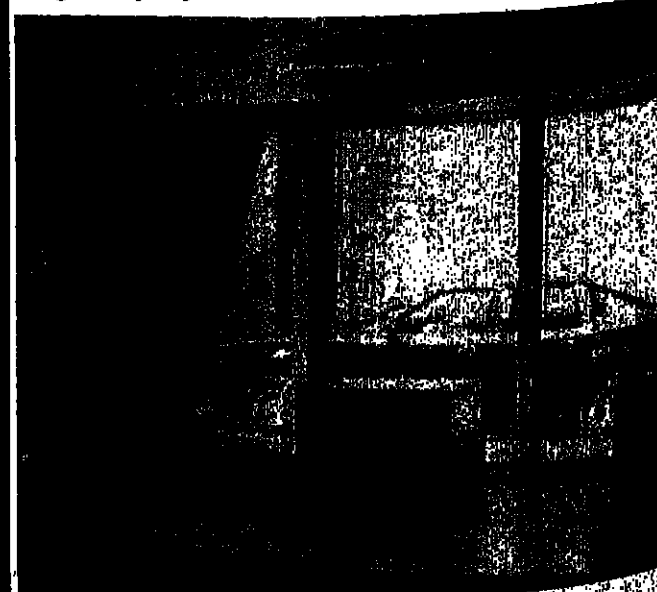
To enable the cars under test to be stored at the requisite temperature, the back of the cold chamber opens out, allowing two vehicles to be pre-soaked before actually being subjected to testing. Up to 38 channels can be monitored in the cold chamber, typically starter motor current during cold starts and temperature, voltage and current measurements during a cold driving cycle.

An engine test facility allows engines to be "mapped", again through computer control, at one man-year of testing can be reduced to 250 hours. Noise and vibration of complete cars is measured in the semi-anechoic chamber (semi-anechoic because the floor is not sound absorbent).

Gaydon also boasts a road test data vehicle workshop, experimental stress labs, corrosion test facilities, and a laser holography lab for whole-engine stress analysis. More facilities than I have space on this page to recount, all of which should provide a major contribution to road safety.



Allegro dwarfed by the semi-anechoic chamber while undergoing noise test.



Rover gets the heat treatment in the climatic wind tunnel.

by Andrew Thomas

PROGRAMMERS PAGE

Logical vs functional fans argue it out at conference

THE logic language Prolog caused controversy at the recent Fifth Generation computer conference in London. The argument was whether logic languages such as Prolog, or functional languages such as Lisp, form the basis of the fifth generation.

The Japanese have already chosen logic languages, and in particular Prolog for their fifth generation project. But this is short-sighted stupidity, according to David Turner of Kent University, who argued the case for functional languages at the conference.

Logic languages, he claimed, are useless at handling deeply nested loops which are fundamental to any programming language.

For the uninitiated, Prolog looks like a query language for a data-base organised in sets and relationships between objects. A typical Prolog statement is:

Which (x John likes x)

This will elicit a list of John's friends.

Functional languages are, as the name indicates, chock-full of functions. The code looks like a shorthand form of the algorithmic languages such as Fortran or Algol. One of the most advanced functional languages is Kent Recursive (KRC), developed under Turner at Kent University (hence Turner's enthusiasm for functional languages at the conference).

A typical KRC statement is:

FACN = PRODUCT (1..N).

This multiplies the first N integers together. Sweet and succinct is

it not? But I can tell you that KRC programs are sometimes very difficult to read, although short.

The functional language Lisp has already had a machine dedicated to it — the Lisp machine from the US corporation Symbolics. This machine has already been used to develop applications in artificial intelligence, and the UK company Racal is now using it to develop expert systems.

By contrast the logic programming language Prolog is still very much a prototype in the UK and US. One company, Expert Systems of Oxford, has been selling a version of Prolog since November 1981, but the language has yet to make much commercial impact.

In Hungary, however, Prolog has been used for a surprising variety of projects including numerical analysis, data retrieval, a Cobol program generator, and for verifying programs written in Prolog.

These and many other applications were described by Peter Szeredi of the Hungarian Institute for Co-ordination of Computer Techniques, at the Fifth Generation Conference.

One of the reasons for the plethora of Prolog programs in Hungary, said Szeredi, is that most of the people involved had little conventional programming experience. This made the language easy to learn, because there were no preconceived ideas to be expunged.

A similar observation was made

by Kowalski at Imperial College, where he found that school-children picked up the language surprisingly well, and in particular found little difficulty with the abstract concept of recursiveness when expressed in Prolog.

The Hungarians also found that the symbol manipulation facilities of Prolog made it ideal for the Cobol program generators developed there, as for writing compilers.

One of Prolog's biggest drawbacks, according to Szeredi, is its lack of functions and algorithmic facilities for manipulating arithmetic expressions and solving equations such as Fortran has.

As a result there was at times a need for a link with Fortran programs, which the Hungarians achieved by use of temporary files accessed by the Prolog program and Fortran routines in turn. Szeredi pointed out that one site developed an experimental interpreter that enables Fortran subroutines to be called directly from Prolog programs.

Another problem that bugged the Hungarians is Prolog's slowness, a result of the present inefficiency of Prolog compilers and interpreters. Various tuning and performance tools were developed, but like the calls to Fortran subroutines, these are just

band-aids, said Szeredi. An increase in the scope of the Prolog language itself, and further developments in compiling languages — which are very high-level — will, Szeredi feels, cement Prolog as a base for concrete applications in Hungary.

Prolog has been implemented on the hardware of seven manufacturers in Hungary, including IBM, ICL, Siemens, Honeywell and Digital Equipment. The latest version, now implemented on the DEC VAX in Hungary and elsewhere, is called MProlog, and is still under development.

MProlog was first implemented on a Siemens mainframe, but has now reached four types of computer.



SZEREDI... Prolog easy to learn without programming experience.

Codasyl accepts UK's VALIDATE proposals

AT last UK proposals for a VALIDATE verb in Cobol have been accepted by Codasyl, the US-based arbiter on commercial computer languages. The verb will eliminate tedious coding to check data in the main body of a Cobol program by providing facilities in the Data Division, in which the type and field length allowed to each datum are currently specified.

Codasyl first considered proposals for VALIDATE in 1975, but rejected them. Last year it went so far as to approve the idea in principle, but it was only last May that the full complex proposals were accepted almost unanimously.

The result is that the VALIDATE proposals will now be written into the Codasyl Journal of Development, which is taken as gospel by many Cobol compiler writers. Meanwhile Ansi, which lays down the most widely accepted standards for Cobol, is considering its new proposals, and is expected to announce a new standard some time this year.

VALIDATE is unlikely to appear in the new Ansi standard, however. According to Anthony Sale, who is the representative of the British Computer Society on Codasyl, Ansi will only embody the new verb if it completely withdraws the proposals under consideration and reconstitutes them. "This is just possible, but unlikely," he says.

The Codasyl Journal of Development is usually about four years ahead of the Ansi standard, and Sale expects VALIDATE to be incorporated into the next Ansi standard.

But impatient users can draw consolation from the fact that they will not have to wait for Ansi's rubber stamp before getting hands-on VALIDATE experience. "People writing compilers base their ideas on the Journal of Development," Sale assures them.

In fact VALIDATE is already available as a preprocessor from a company called S+PC, whose managing director John Piggott

chaired the BCS Cobol working party on the VALIDATE proposals. This preprocessor enables a program to be written using the VALIDATE verb. It then generates code acceptable to the compiler by bringing the validation back from the Data Division into the main program body, known as the Procedure Division.

Without the VALIDATE verb, all data checking has to be performed by specific code in the Procedure Division. VALIDATE allows this to be done in the Data Division, which contains all the other data specifications such as type and length. All the coder has to do then is write VALIDATE into the Procedure Division, followed by the name of the data item to be checked.

VALIDATE offers a number of checking facilities, including the specification of numerical ranges, and the ability to list admissible numerical and alphabetic values.

A more sophisticated check allowed is the specification of the value of the final digit in a data value according to the value of the rest of the data field.

PUZZLER

SIXTEEN
FIFTEEN
SEVEN
FIVE
FIVE
ONE
ONE
ONE
ONE
FIFTYONE

As usual with our alphametics, the task is to determine the placements of all digits used in this addition sum. See page 47 for solution.

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GW 7/82



AN important feature of Setten & Durward's Atlanta 3D data filing system is the plastic slide suspension in a binder without the need for mechanism which doubles up as a printer to be removed. The loader binder can then be suspended quickly and easily in the appropriate part of the static or mobile filing system, the company says.

Setten & Durward Ltd (CW), Carnarvon Works, Waterloo Road, Llandrindod Wells, Powys LD9 6BH. Tel: 0597 7791.

Monitoring system helps assess use of manpower

JUST launched is a computer system which, says its developer Mitrefinch, automatically monitors and can help manage the cost-effective use of manpower.

The expense and performance of the workforce can be measured at all times, accurately and immediately, says the company. The system features the Mitrefinch MF 3000 series minicomputer.

Electronic clocking-in technology automatically transfers complete manpower attendance in-

formation including the number of people employed and their whereabouts, their wages and work skills, and overtime and shift arrangements. Payslips are worked out automatically.

An immediate benefit, says Mitrefinch, is to reduce or even eliminate any administrative element in the work of time-keeping, control and payroll supervisory staff, as well as increasing overall accuracy. One of the company's analyses gives the example of a firm em-

ploying 6,000 with potential to trim an administrative staff of 32 to 4 or fewer.

Immediate financial analysis is also made possible, says the company. Central display consoles can be programmed to reveal current costs of production, and therefore highlight any changes necessary in staffing against budgets.

Mitrefinch Ltd (CW), Tower House, Fishergate, York YO1 4KA. Tel: 0904 52995.

CAD system's drafting enhanced

APPLIED Research of Cambridge has announced two enhancements to its recently launched GDS 3 computer-aided design system.

The first of these, called Multiplot, is an enhancement to drafting productivity. It enables a user to quickly construct new drawings by using existing material held within his CAD system.

Multiplot allows a GDS user to assemble various views or windows of any existing drawing and then re-scale, re-position and rotate them as required and assemble them into a new drawing, interactively on the screen, without the necessity of re-drawing the object.

The new drawing can then be plotted out directly or, alternatively, recorded in its own right in the GDS drawing file to act as the basis for other design projects.

A second GDS 3D subsystem provides the facilities necessary for a GDS user to generate three-dimensional information from a 2D or 2.5 dimensional drawing.

Applied Research of Cambridge Ltd (CW), 4 Jesus Lane, Cambridge CB3 8BA. Tel: 021 65015.

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At the Dubai International Trade Centre, Dubai, UAE, December 13-16 1982. These were just some of the comments made at the outstandingly successful 1981 exhibition:

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FRANK HARRISON, GENERAL MANAGER, SYSTEME (GULF).

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EDDY BLAKE, PACKAGE CONSULTANT, ALPHIA DATA PROCESSING, ABU DHABI.

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PHILIPS DUBAI, PHILIPS DUBAI.

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NAME OF EXHIBITOR WITHHELD BY REQUEST

THE 1981 GULF COMPUTER EXHIBITION

Systematic registration of visitors and exhibitors' questionnaires revealed

* 3,038 top-quality visitors came from 36 worldwide countries.

* 92.5% of exhibitors were "very

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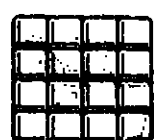
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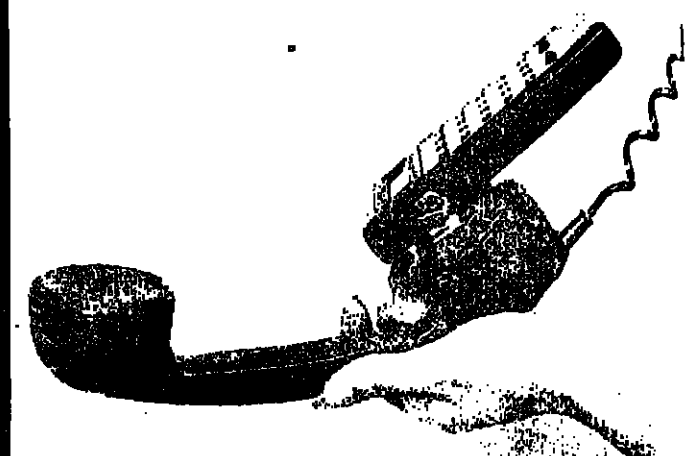
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Pocket terminal fits phone

ON the market from MSI Data International is a small hand-held computer terminal, the MSI/55.

Less than half the size, says MSI, of conventional data capture terminals with comparable features, it is small enough to fit easily into a coat pocket. It weighs

less than six ounces, measures 5 1/2 in x 2 1/2 in x 1/4 in, and can be fitted directly onto the mouthpiece of any standard telephone handset.

MSI Data International (CW), IVC Building, 10 Portman Road, Reading, Berks.

Tiny printers for use with calculators

TWO miniature, dot matrix, impact printers have been introduced by Epson UK.

The Model-160 and Model-161 are suitable for use with pocket calculators, microcomputers, point of sale terminals and other applications such as desktop business calculators where a clear printout is essential for record keeping, says Epson.

The Model-160 can print a maximum of 144 dots per line or a maximum of 24 columns of 5 x 7 dot matrix characters on 58mm width paper. The Model-161 has a slightly larger print size and can print 96 dots per line or a maximum of 16 columns of 5 x 7 dot matrix characters, also on 58mm width paper. Print speed for the Model-160 is 0.7 lines/sec; for the Model-161 it is 1 line per second.

A replaceable single ribbon cassette ribbon is provided and approximately 5 x 10⁵ characters can be printed before a new ribbon is required. Colours available are purple and black.

These printers operate from a 4.5V DC supply and their motors draw a mean current of 0.2A. Ambient operating temperature range for both models is 0°C to +50°C.

Epson UK Ltd (CW) Dorland House, 388 High Street, Wembley, Middlesex. Tel: 01-900 0466.

Mini geared to electronic mail

A family of minicomputer systems, the 6000 series, has been launched by Billings, Computer Corp of Missouri, US.

The series is an implementation of the recently introduced Billings distributed processing network using functionally structured distribution, and is geared for users requiring between 25 and 275 terminals.

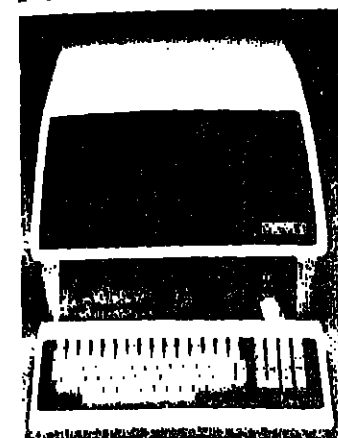
The company says that because of the nature of this new technology, this system is ideally suited for applications such as electronic mail and remote access of common databases.

Concurrent with the announcement of the 6000 line, Billings demonstrated electronic mail software capable of supporting more than 10,000 users.

Because of the network architecture, it is possible to attach numerous CPUs to the same system, thereby providing the DP power required to handle larger, more active databases, says Billings.

Mass storage devices supported by the system include 30 and 60 megabyte Winchester drives with a streaming tape as the Winchester backup.

Billings Corporation (CW), 18600 East 37th Avenue, Independence, MO 64051. Tel: (816) 373-0000.



Graphics for 16-bit market

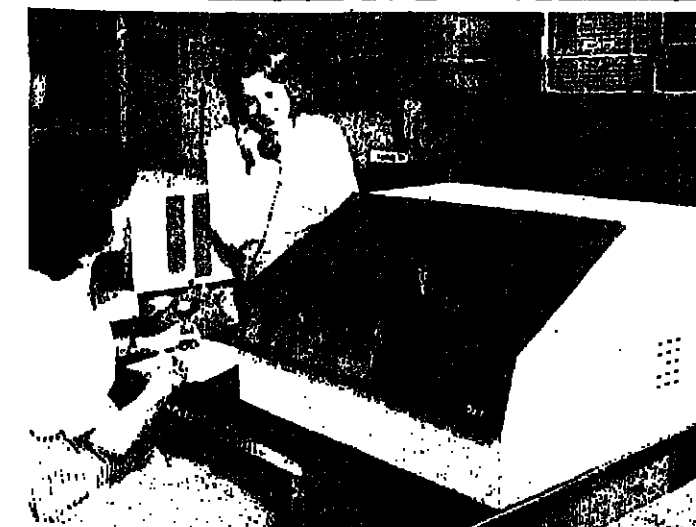
THREE Vector Graphic systems have been released by Almarc. The first, the Vector 4 (above) incorporates both Z80 and 8088 processors and has been designed to provide compatibility with existing software, with an eye towards the fast developing 16-bit market.

Operating systems include CP/M 2.5 MS-DOS and Oasis. The system comes with either two integral floppies or one integral floppy and Winchester. 128K RAM is standard expandable to 256K, and three S100 card slots are provided for interfaces, controllers or I/O boards.

The Vector 4 includes a detachable keyboard and a green phosphor video display screen which, Almarc believes, helps give faster access to screen memory and enhanced graphics on the 640 x 312 pixel display.

Along with the V4 come the Multishare systems, 500SE and 503ZE, with 5 and 32 megabytes of hard disc storage, both accommodating up to five users.

Almarc Data Systems Ltd (CW), Great Freeman Street, Nottingham NG3 1FR.



Acoustic covers aim to minimise printer terminal noise.

Cover cuts printer noise

A NEW name in the office computing accessories market, Durst UK of Epsom, Surrey, has launched a range of acoustic covers for desktop computer printer terminals.

Durst's covers were shown to produce an overall reduction in noise level of 14.5dBA, which represents a 95% reduction in noise energy compared to an unc-

closed printer terminal.

The covers are available direct in self-assembly kit form. They are constructed in aluminium, with a hinged, smoked acrylic front cover, providing easy visual and physical access to the machine.

Durst UK Ltd (CW), Felstead Road, Longmead Industrial Estate, Epsom, Surrey KT19 9AR. Tel: 037 27 26262.

Expanding

A COMPREHENSIVE range of cabinets and consoles is now being offered by Communication Accessories and Equipment Limited (CAE).

The company, which supplies wired assemblies and sub-systems to the electronics and communications industries, has expanded its manufacturing facilities to increase production of industry standard cabinets and consoles.

Communication Accessories & Equipment (CW), Akeman Street, Ryng, Herts HP23 6AJ. Tel: (0442 52) 4011/5551.

Office models

OPERATORS often suffer from hypertension, neck strain, back pain and similar problems.

There are five advanced models in the Facit Office Furniture range which may help. Facit offers a chairbase table unit; a mobile terminal table with two stems; a screen-hung terminal table; an individually adjustable table top; a machine table with recessed well; and a terminal desk with a modular top.

Facit Office Furniture Division (CW), 3/4 Little Portland Street, London W1. Tel: 01-636 1164.

Univac expands System 80 range of micros

SPERRY Univac has introduced two new models in its System 80 family of computers, offering improved system performance, greater throughput capacity, and growth potential, says the company.

The key benefits of the new models, known as Model 4 and Model 6, are greater disc storage capacity up to 4.8 billion bytes, a new disc cache feature that improves the input/output operation, a new streamer tape providing a high-speed streaming mode operation for disc media backup, and a new local workstation with enhanced capabilities.

Representing performance upgrades for the existing Model 3 and Model 5, the new processors also feature enhanced software, including improved job scheduling, optimised share file performance, enhanced memory management, and a performance improvement in the Escort programming language.

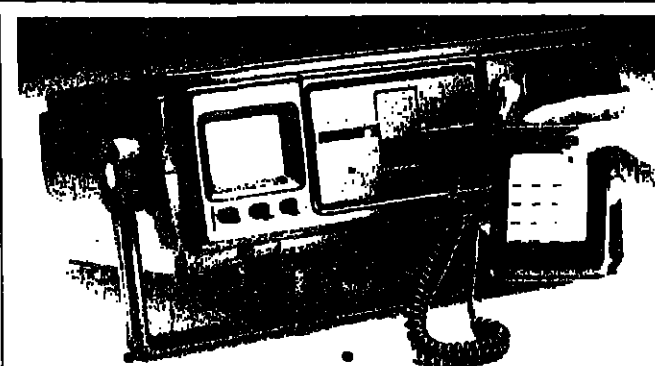
First customer deliveries of the new models are scheduled to begin this month, and field upgrades of Models 3 and 5 will be available at the same time.

The System 80 family of computers is based on advanced technology including multiple microprocessors, multiple bus architecture, Emmitter Coupled Logic (ECL), and Large-Scale Integration (LSI).

Main storage for the Models 4 and 6 start at 512 Kbytes and can go up to a maximum of four megabytes.

System 80 uses the OS/3 operating system, which supports a high level of multiprocessing, a full range of programming languages, and systems for transaction and database processing, says Univac.

Sperry Univac (CW) Ltd, Stonebridge Park, North Circular Road, London NW10 8LS. Tel: 01-965 0511.



Portable stocktaking device in use at Allied Breweries pubs.

Briefcase stocktaking

THE "computer in a briefcase" which is currently being introduced for stocktaking at the 320 managed houses of Joshua Tetley & Son, Allied Breweries' Leeds subsidiary, has been produced by Leeds-based Systime.

It weighs only 20lb and includes a processor, a three-inch video display, floppy disc and printer.

The portable stocktaking device, PSD, provides several important advantages over existing methods which require the stocktaker to read through sheaves of sales and stock data, says Allied Breweries. One is that the terminal

can easily store details of Allied's 500 product lines; another is that it is fully interactive and guides the stocktaker, whenever necessary, by telling him what to do next.

The processor is an Intel 8080 with 32K dynamic RAM. There is a 3-inch video monitor, driven by Intel 8275 CRT controller; a Mitsubishi thermal printer; asynchronous and synchronous communications capability via standard RS232C interface; and a 5 1/4-inch, single-sided, 80-Kbyte floppy diskette.

Systime Ltd (CW), 432 Dewsbury Road, Leeds LS11 7DF. Tel: 0532 702211.

Micro performs 'like mini'

FUTURE Technology, the UK distributor of Micro Five computers, has launched Micro Five's Series 3000 16-bit business computer through its network of dealers. The Series 3000 is based on the Intel 8086 and is capable, says Future Technology, of minicomputer performance.

The company says the machine is designed to minimise processor overheads by providing data transfer by direct memory access on all of its 11 input and output ports.

Winchester disc drives have been integrated into the desktop processor cabinet, giving storage options of 10, 34 or 70 Mbyte. In addition, an integrated cartridge tape and floppy disc are supported for security backup and software distribution.

The system supports three operating systems: MP/SL's MicroCobol BOS; CP/M-MP/M-86; and StarDOS, Micro Five's multi-user system.

Future Technology Ltd (CW), Britannia Way, Lichfield, Staffs WS14 9UY. Tel: 05432 57701.

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Middle East Computing began as a single-issue publication, backing the Gulf Computer Exhibition and Conference at Dubai last December. Its enormous success revealed such an urgent and widespread demand for computer product information that it will be published regularly from April.

6000 copies will be sent to established computer users or key personnel within government and major business organisations, in the Middle East countries predominant in the computer market. The circulation was compiled through the full research resources of Computer Weekly and IPC Business Press backed by contacts made at the Gulf Computer Exhibition.

Middle East COMPUTING

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John is 1.50

The marketing pace hots up for the plug-compatibles

PCMs are having to cope with new marketing ploys by IBM and increased competition, together with a fall-off in demand . . . Alan Simpson reports

ONCE again the large-scale disc storage market has become a front line issue. Even the most micro-blinkered individual cannot fail to have become aware of considerable levels of turmoil and agitation, plus not a little confusion.

Industry analysts on both sides of the Atlantic have been having a gala time interpreting the situation for those of us without the benefits of a direct line into IBM, Wall Street or leading brokerage houses.

The supply and, to some extent, the demand for large-scale disc storage systems revolves closely round IBM marketing and production strategies. Any hint of a new IBM computer range will have an immediate impact on the supply and demand of existing disc product systems.

Companies such as IBM tend to

pre-announce new machine and equipment ranges in advance of production delivery schedules. Unlike the automobile industry, where great secrecy surrounds the introduction of new models until such time as local dealers are well stocked, the computer industry attempts to pre-empt the opposition by releasing future marketing plans.

The reasoning behind this early warning approach is justified on grounds that existing users need to plan ahead their growth path for the next few years. The user, it is hoped, will hold off purchasing his advance level requirements for a while until the new range is available.

But the by-products of early release are somewhat more dramatic than merely giving growth assur-

ances to existing or potential customers. The value of existing equipment plummets in the face of the impending new system which by tradition, is required to offer more power for less cash.

In order to secure a place in the early delivery queue, multiple first-day orders are placed, many of which will turn out to be merely a security holding operation by users and brokers.

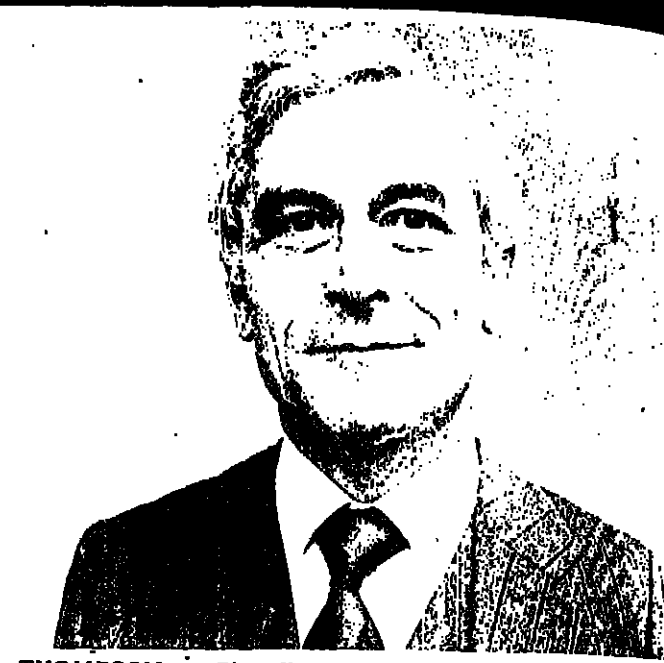
Meanwhile, other ripples are spreading out towards the manufacturers of media storage systems. In order to meet the anticipated demand for new disc systems to match the new computing range, developments are initiated. But in the meantime existing users have to bridge the system gap by incorporating ever larger amounts of disc storage.

All of which puts the disc supplier, IBM included, in some-

thing of a quandary. Not only must the concentrated R&D teams work on producing related media for the forthcoming system, but the production teams must also meet the escalating demands for existing storage products.

Unlike most other manufacturers, IBM is blessed with a highly competitive body of keen media suppliers, known collectively as plug-compatible manufacturers. The key to PCM marketing is not only to anticipate IBM new technology releases, but to predict timescales. Although the PCMs themselves can start development programmes, they cannot be totally sure that they have read the signals correctly until IBM releases its first machine.

Not surprisingly, the PCMs are among the first purchasers of new IBM equipment, and little time is



THOMPSON . . . Given line management responsibility to boost floppy sales at STC.

lost in stripping it down to basic electronics. Getting the right degree of intelligence is all-important for the PCMs, whose reputation and prestige are on the production line.

But this is far from easy. IBM announced its new mid-range 3083 computer system in April this year, which has the usual effect of dramatically lowering the second-hand price of its existing 3033 models, in some cases to under 35% of list price.

At the same time, because of IBM's inability to provide associated high performance 3380 disc storage drives, the 3081 range has been somewhat neglected.

Suddenly, all is about to change once more. IBM has rather unexpectedly announced that the 3380 developments and production bugs have been sorted out and the company will be able to commence international deliveries next month, by which time it is estimated over 1,500 will have been installed in the US.

The news has dismayed the PCMs, one of whom only last month was promising delivery shipments for the third quarter of next year.

The PCM marketplace, however, seldom remains depressed for long. In most cases it is as well informed on IBM marketing and production strategies as IBM board members. But this time round, the PCMs could have a serious problem on their hands. Not only are they having to compete with a more hostile IBM, but with their equally aggressive PCM competitors, several of whom have recently regrouped their marketing operations. There is also the matter of a user demand slowdown, both here in Europe and in the US.

According to John Fuller, managing director of Baser-based brokerage company PCML, the plug-compatible industry is in a highly vulnerable position following recent marketing ploys by IBM.

In addition, the companies themselves are each undergoing certain change and restructuring. Storage Technology has recently lost senior members of its development team to the newly established company Ibis. Closer to home, Derek Thompson has been made head of UK operations to boost floppy sales.

Memorex is similarly regrouping its resources following its acquisition by Burroughs, and is hoping to re-establish its European marketing position. Control Data also appears to be experiencing problems and has recently announced that it is temporarily closing down some of its peripheral equipment plants between now and September. Even so, the PCMs are tipped by many observers to win the first part of the PCM market, with competitive 3380 models, the IBM end-user and OEM markets.

Although IBM is some two years late in achieving volume production and delivery, this itself is not quite ready with its 3380 look-alike system. But the company expects production to be in full flood by the end of this year.

Even more problems are now appearing on the PCM competitor front. The Japanese are believed to

be gathering forces and can be expected to launch their disc storage assault on the marketplace next year.

The established PCMs are unlikely to surrender their market share without a keen burst of price-cutting and aggressive marketing. This is one battleground where the user is bound to win.

Fuller admits to being impressed with the speed which IBM recovered its power and prestige. From what appeared a near disaster, the company has recovered its reputation. IBM is more fortunate than the PCM companies. If IBM does make a supply mistake, users become angry at first, but rapidly forgive and forget.

The PCMs cannot afford to make any mistakes and will benefit from the past 18 months when, by all accounts, they had a sales field day and were able to establish a good marketing and promotion image.

The collective view of the disc storage system suppliers is that this year will see a general slackening in demand, with users experiencing only limited growth. Martin Ginger, European marketing manager for disc systems of Sto-

IBM has recovered its reputation from what appeared a near-disaster

rage Technology, believes that the sales setback is more a matter of user deferment. The only positive decision that many users worldwide are making is not to make a firm decision.

However, Ginger believes that there is only an apparent surplus of disc. Overall sales are somewhat ahead of last year's record levels.

This view is shared by Cal Proctor of Ibis who believes that IBM alone will not be able to meet the pent-up demand for large capacity storage systems. Similarly, Fuller agrees that the market, which has experienced a growth factor of 10 in the past five years, will continue to expand.

These views are realistic. Given the undoubted movement towards the development of company communication channels, and networks, and more comprehensive structures of corporate databases, the requirements for large data stores will continue to expand. Similarly, user applications are placing heavy demands on disc storage space for such activities as distributed systems.

Fuller points out that within the next decade, with the advent of artificial intelligence, companies could be thinking for themselves in a process which is a notably heavy user of disc storage space.

Current technology suggests that most data processing will be online in the near future. Work at London's Imperial College is already proceeding on artificial memories, a form of short-term memory which can replicate itself. Rotating memory developments will liberate processing finite life.

COMPUTER SUPPLIES - 1

Our three-page feature opens with a quick review by Boris Sedacca of this capital-intensive industry

IBM rules the market

THE computer industry is not all fast moving and dynamic. Certain sectors, in particular computer supplies, can be described as steady-state at best.

But in the case of computer supplies, although the products themselves are not particularly exciting when compared with the hardware, the equipment needed to produce them can represent a substantial capital investment.

In this kind of market for undifferentiated products, where changes are not very frequent, exploiting economies of scale in production is virtually the only way for companies to operate profitably and to compete with each other, especially in the case of magnetic media.

There are numerous brands of floppy disc on the market, but the only difference between them is in

their labels, because manufacturing is limited to a handful of companies like Control Data, BASF and Rhone-Poulenc.

These companies look at their markets in different ways. Chemical groups like BASF and Rhone-Poulenc would regard their floppy disc businesses as profit entities in themselves and are content to let IBM lead the way and to fall in behind it.

On the other hand, a computer peripherals manufacturer like Control Data would regard floppy disc manufacture as a way of getting the cash in to feed research and development programmes on more advanced storage technologies, with the aim of keeping up or competing with IBM.

Although nobody paid much attention to the media before, the

problems IBM has had with its 3380 disc drive platters have demonstrated how important this area is. Today's R&D problems at IBM are tomorrow's marketing opportunities for computer supplies manufacturers.

As IBM has made no significant announcement for years on the magnetic tape front, the market is fairly static at the moment, but a new wide-tape streamer drive to back up 3380 disc drives is expected soon.

Those manufacturers who can move fast and offer a cheaper alternative to the IBM tape will make a tidy profit while the product is still at a premium, provided they can move before others jump in and saturate the market. By that time the user rather than the manufacturer becomes the main beneficiary.

So many companies have jumped on to the supplies bandwagon that a lot tend to fall off, says Brian Payne

Buying and selling are harder than you think

BUYING supplies sounds simple; so does the selling of supplies in an ever increasing market. Unfortunately, Tom, Dick and Harry think so too.

Hundreds of small companies have sprung into being on the premise that in a rapidly growing market there must be a lot of business to be had by all. The hardware and software business is high risk and needs a lot of expertise, and big financial backing. So what's left? The ancillary, accessory and supplies market. All dive in; the water's fine; it doesn't need a lot of experience and expertise. Or does it?

The answer in most cases is "Yes, it does." Advising the first-time user, especially on requirements such as identification and choice of magnetic media, correct care, storage, filing of the media and output printouts, forms handling, fire protection or safe housing of backup data, dust and dirt control and so on, does need a lot of knowledge and experience, plus the ability to obtain and supply that product at the right price.

The first thought of most first-time buyers is "Oh, I'll buy it from the people who supplied the computer." As most professionals who have been in the industry for some time know, this can be a very expensive method of buying supplies. As this area is a semi-captive market for them, the computer manufacturer, OEM, or agent can, and very often does, charge what he likes for a given product, especially magnetic media.

These offers of supplies at sky-high prices, usually justified by the salesman with the claim that all items have been individually examined and tested, etc, are very often interspersed with such endearing words as "If you don't use our media/recommended product, it may nullify or affect the guarantee and maintenance contract."

Fortunately, most computer professionals no longer give in to this type of pressure. In most cases they are aware that they can buy an identical product (even made by the same manufacturer) at considerably less and sometimes down to half the price.

The next possibility in buying supplies is to find the individual manufacturers of magnetic media, ribbons, fire-safes or furniture; contact them individually and make an appointment to see each salesman.

This sort of approach is ex-

tremely time consuming and the buyers will probably not save any money. They will, in many cases, be referred straight to a main distributor.

In recent years a small number of specialist computer supplies companies have been developing what is probably the easiest and most cost effective method of purchasing all the items required. This is the age of the (usually) comprehensive and informative colour catalogue, where the buyers can look through at their leisure and pick out the items they are interested in, look up the price, and if further information or advice is needed, experienced people are available at the other end of the telephone to help them. What could be simpler?

These catalogue companies have mostly been established over a period of years and have developed carefully selected or individually designed comprehensive product ranges.

A company of this type needs to be a certain size to sustain a catalogue successfully, and they therefore have a distinct advantage over most of their competitors. They can benefit from economies of scale; they can buy in large quantities, thus getting better buy prices to remain competitive; they can manufacture their own design of products like VDU tables, modem units, tape and disc racking, trolleys. And this, again, means that prices can be very reasonable.

It also means that if the customer does not want the standard design, it is possible for him to have the product either modified or built to his own specifications at relatively little extra cost.

The better distributorships for items like quality fire-safes and forms handling kit are generally given to these companies, as they can do a better job of marketing with a much higher sales turnover through their catalogues. For the small supplier, however, the choice of what else is available in similar products is very limited, and they cannot therefore usually offer the customer the best choice of equipment or product at the best price for his requirements.

As large stocks are usually held, the goods can be despatched shortly after the receipt of an order.

The biggest nightmare, and certainly the most confusing for computer buyers, is the selection of

consumable products such as printer ribbons, continuous labels, cleaning products and magnetic media. There is a limited number of manufacturers but the labels under which you can buy their products seem countless. You have no way of knowing who the original manufacturer of the product was, or more important, that it will stay the same from one month to the next.

You think you have found the right product at the right price, with the right service; it all works fine. What happens if the supplier of that label (and surprisingly in some cases, even big name labels are not the manufacturer) changes his buying policy, or sometimes buys from several manufacturers? You could be back at square one with the next delivery!

Having said all that, there is often little difference from one brand name to another, especially with magnetic media. My advice is to get a good compromise between quality and price.

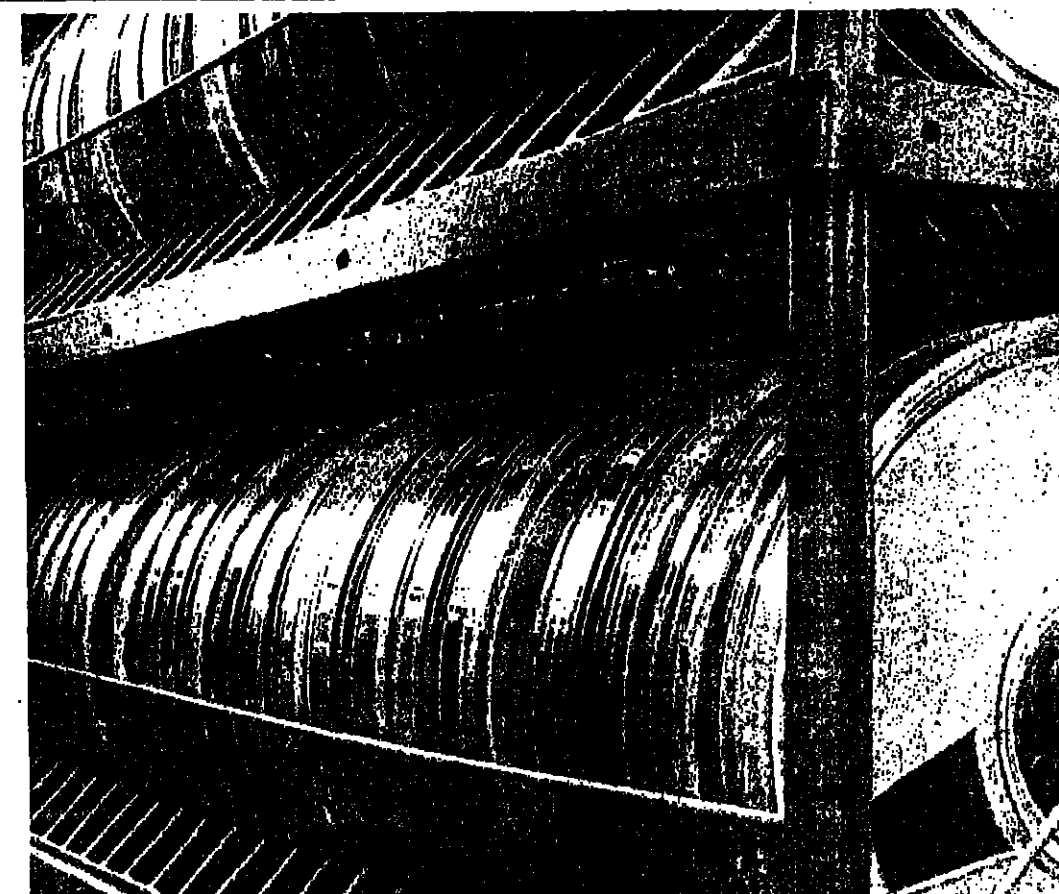
On the other hand, buying too cheaply can create problems. There is usually a reason (like they can't sell it any other way.) With these products usually work very near the line, and the quality is more likely sometimes to slip the wrong side of this very critical line.

You may think you have had problems buying supplies. The other side of the fence is no picnic either. During this time of economic recession over the last few years, there has been much coming and going of companies, especially recently in the cut-price league. Very often this is a last ditch effort by a company desperately trying to stay afloat on stormy seas, rather than a strategic marketing policy.

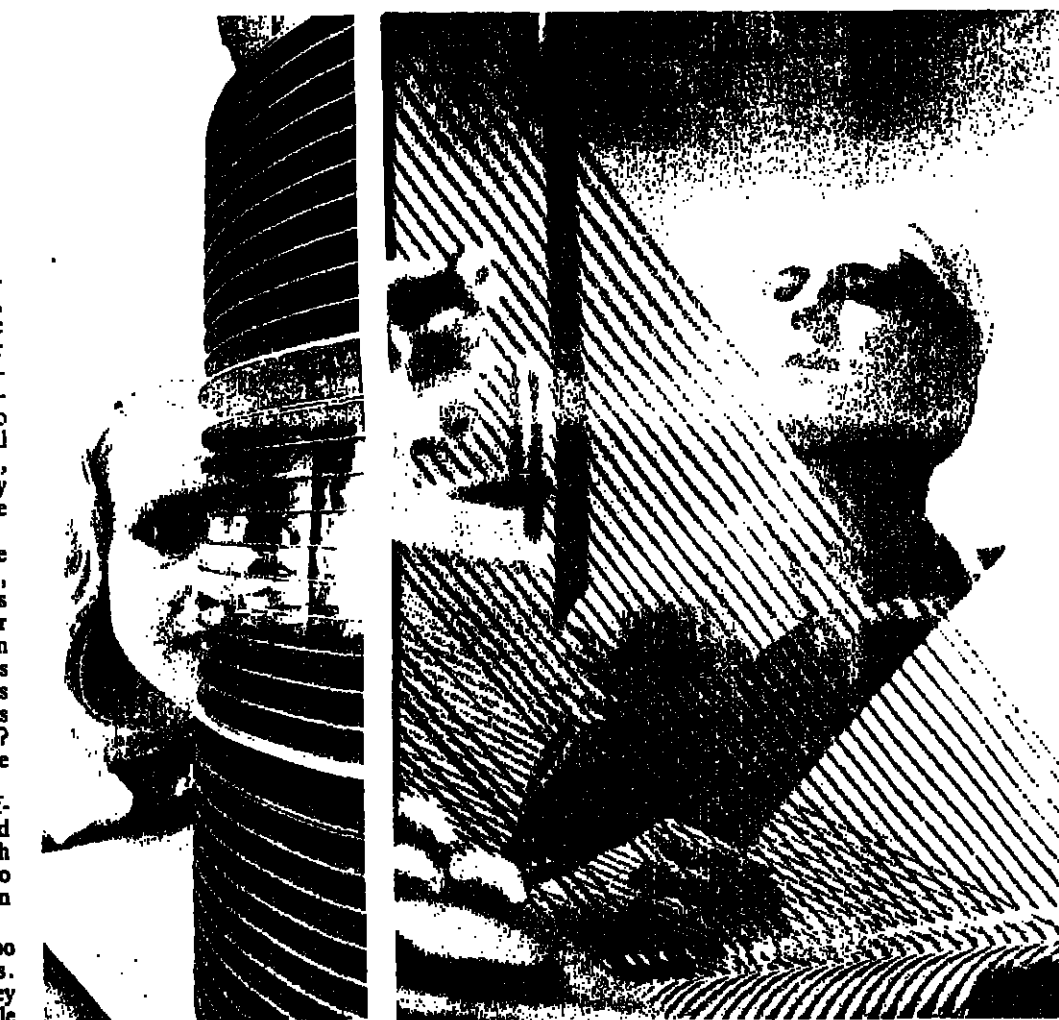
Owing to the tremendous number of companies that have jumped on to the supplies bandwagon, a lot also tend to fall off, hurting themselves and others in the process. The casualty rate is quite high.

While the customers' budgets are restricted, or in some cases strangled, people tend to make do with things rather than buy what they should actually be using. This makes the law of the jungle (the survival of the fittest) more likely to operate. Make sure you back the right tiger!

Brian Payne is marketing director of DN Computer Services.



Wide-tape streamer drive may soon be launched on this undynamic market.



What's the name behind the label?

Mag tape manufacture at BASF in West Germany.



Output from the IBM 3800 laser printer.

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CJW

Sloppiness in the treatment of media can result in the loss of data ... Lina Williams advises on how to prevent this

Magnetic tape may not be exciting - but poor handling means disaster

IN ANY field, hardware excites attention and media invites boredom. It is the camera, not the film; the hi-fi, not the disc; the tape drive, never the tape. But film and disc are vital to the end result and poor tape handling and storage are probably responsible for the majority of data losses which simple but important procedures can prevent.

The majority of tape problems are caused by either poor handling or hardware faults. Magnetic fields, radar signals, metal detectors, X-ray contamination, high electrical charges, microwaves, television, nuclear radiation and laser beams have all been investigated as possible causes of data loss and have been found to pose little threat.

In one test a large scrap metal electromagnet was placed 1.3 feet above recorded tapes, yet no data loss occurred. When a horseshoe magnet strong enough to lift 40 pounds was held one inch from the edge of a reel a signal loss of only 22% occurred. This did not result in any data loss at all, since it was found that a signal level of less than 50% could be recovered.

However, any small permanent magnet could cause a loss of data if placed directly next to or on the surface of the magnetic media and read/write head, so demagnetising should be carried out regularly.

Fire obviously poses a threat to computer tape, but two reels in tests functioned adequately after exposure to 210 degrees F and data was recovered from tapes subjected to 230 degrees F after two months' "test".

Theoretically, gamma ferric oxide particles which are the prevalent magnetic constituents used in most magnetic storage media are capable of retaining data up to a temperature of approximately 1,247 degrees F.

Carbon dioxide-type fire extinguishers are recommended for magnetic tape stores. Carbon dioxide is clean and contains no chemicals that could harm the tape. Tape

that is kept in canisters will be protected from the water spray of a sprinkler system but should tape become water damaged it should be allowed to dry at normal room temperature and then rewound at least twice.

In the unlikely event of computer tapes being subjected to extremely low temperatures, they should be relaxed over a period of days at gradually increasing temperatures.

Ideally, the work area should aspire to a clean room environment - an area free of airborne dust and lint. Smoking, food and drink should be prohibited and staff should, if possible, wear lint-free smocks. Temperature should be in the 60-90 degrees F range, relative humidity should be between 20% and 80%.

Whenever possible, the air pressure within the room should be maintained at a higher level

Any small permanent magnet could cause a loss of data if placed next to the magnetic media

than the surrounding areas as this will prevent dust infiltration through doors and windows.

A sure sign of developing edge damage, one of the most serious and common forms of tape failure, would be a lip or distortion on the edge of the tape. A series of nicks or mutilated areas along one edge probably means a cracked or broken flange.

Damage to both edges probably comes from a distorted reel as the tape is allowed to rub against the flange when being used. A similar type of edge damage will also occur if the transport is misaligned.

If the transport and read/write heads have become contaminated

with dust from a previous tape, the contaminants can be dumped on the backing or coating surface of subsequent tapes. This contamination will wind into the reel under pressure, causing it to adhere firmly to the tape surface. Each of these deposits will appear as a dropout or a group of dropouts the next time the tape is used.

Fingerprints form excellent holding areas for dust and lint. Dirt deposits will transfer from the backing of one wrap to the coating of the next, but use of lint-free gloves will eliminate this problem.

Frequent cleaning of the tape drive will reduce the chance of fingerprint contamination spreading from one reel of tape to others in the library. A cotton swab or lint-free pad moistened with Gensolve-D (an Allied Chemical trade mark) or Freon TF (a DuPont trade mark), or similar cleaner is recommended for cleaning all elements of the tape path on the handler.

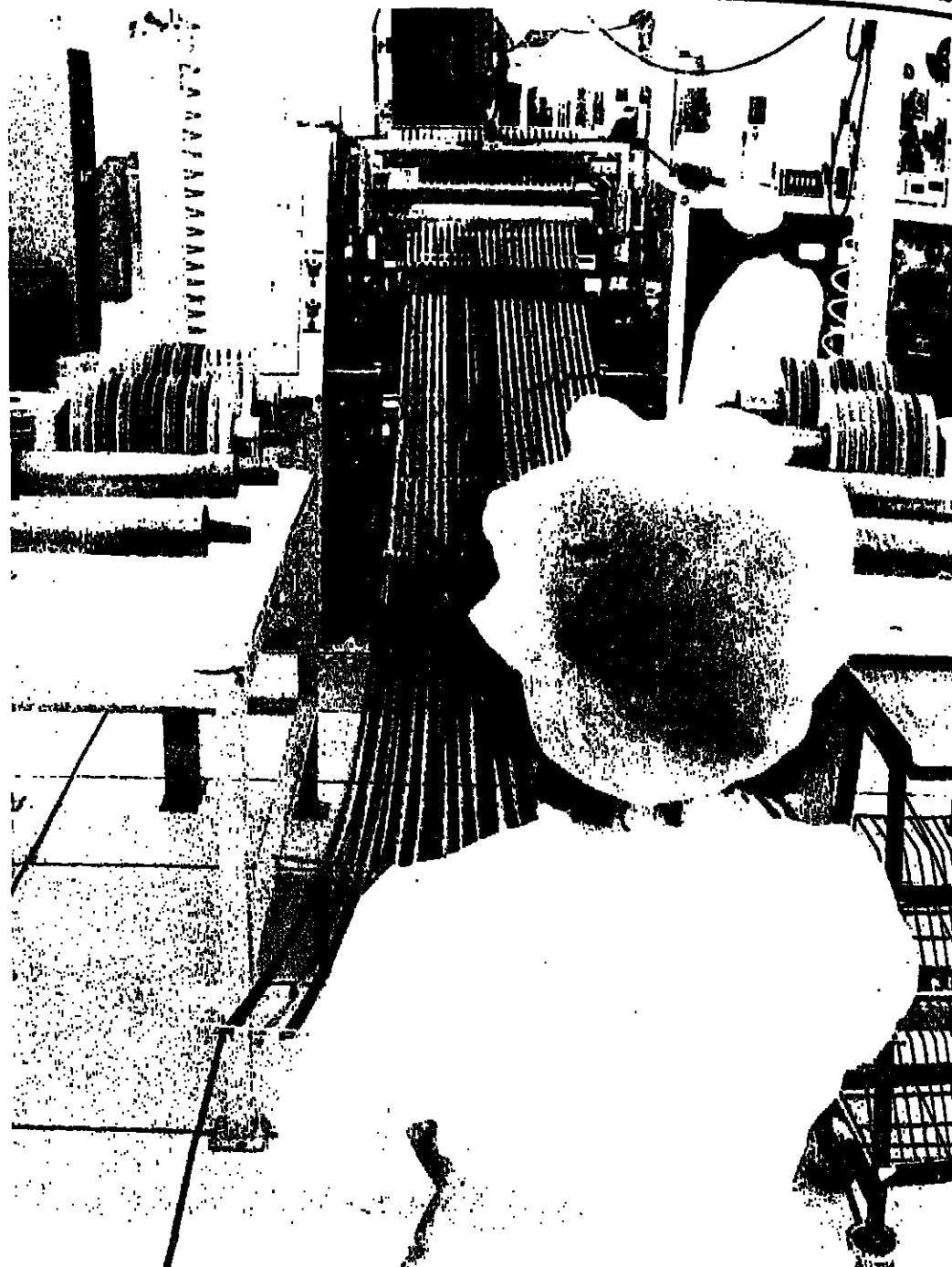
If other types of cleaning agents are used they should be given time to dry thoroughly before the tape is loaded. This will prevent damage to the tape should the cleaner have any tendency to attack the magnetic coating.

Wind tension should be relatively low. Six to eight ounces per half inch of tape width is sufficient to render a firm, stable wind. Too high a tension could result in high pressures within the reel that could permanently distort the polyester backing.

However, if the wind is too loose, slippage can occur between the tape layers on the reel. The next time an attempt is made to use the tape, the wrinkles and creases can disrupt contact between tape and head and result in a series of data losses.

If "clinking" should occur the tape should immediately be rewound properly.

Another important consideration is wind quality. The successive layers of tape should be placed on the reel so that they form a



The work area should aspire to be a clean room environment.

smooth wind with no individual tape strand exposed. If the wind is scattered the exposed strands are vulnerable to damage.

Tapes that have not been used should be removed from store every six to nine months and exercised by winding, rewinding and relaxing. If loose winds, dust accumulations, ripped edges, physical distortion or data errors are discovered, then additional samples should be inspected to ascertain what percentage of the library may be affected.

Although the magnetic coatings of most computer tapes now available are conductive, the high tape speeds and rapid start-stop times used in modern tape transports may still cause problems with static electricity. Static build-up on the tape or transport may attract dust and cause tape drag or skew. The temperature and humidity recommended earlier (70 degrees F, 50%) will reduce this problem to a minimum.

Even so, static build-up may still be a problem and the only solution is a textured substrate which is highly conductive and which, therefore, reduces the attraction of airborne debris.

Back-coating is already widely accepted in the UK for other demanding tape applications such as

video and instrumentation and is now gaining increasing acceptance for computer tape.

Back-coating also helps make a number of other problems in particular problems caused by debris and uncontrolled environment.

While conventional tapes scratched by tape guides may deposit polyester chips and fibres on both tape and read/write heads, back-coating is much more durable and resists the generation of polyester debris.

Should dust or debris be introduced into the wind, the increased compressibility of a textured backing - twice that of a conventional non-back-coated tape - enables the tape to absorb the stress and reduces surface distortion caused by impressions from the wound-in debris.

The author is customer service manager for 3M Data Recording Products.



Frequent cleaning of the tape drive will reduce the chance of contamination spreading throughout the library.

No company can afford to be without adequate fire-resistant storage to protect valuable data, says Bob Forrest

Fire safety is a matter of commercial reality and company survival

IT IS a fact that no less than 43% of all companies suffering a fire go out of business afterwards. Even if they survive, life becomes difficult, with 14% of companies which have had a fire facing a reduction in their credit rating. But perhaps this statistic is not surprising, since 17% of companies cannot furnish a financial statement after a fire.

In 1980, fire loss figures reached an all-time high of £467 million, but this figure only touches the surface of the problem, ignoring the other effects which make the survival of the business after a fire so difficult.

Fire protection is a logical extension to media suppliers' existing storage ranges. A range of computer supplies without fire protection seems incomplete, and office managers should look at their own storage requirements as a matter of commercial reality and company survival.

Of course, it is sometimes possible to safeguard oneself against the effects of fire by placing all of the company's records in a properly constructed vault, but it is worth remembering that 51% of all fires in offices occur during working hours, and it is just a little unreasonable to expect staff to risk their lives moving records to safety when every instinct demands a dash to safety.

The only real answer must be some form of fire protection close

to the point of use of the material, and that means a firesafe.

Apart from the cost of a vault, staff should not have to waste their time moving material in and out of the vault every morning and evening.

But how can a fire have such a devastating effect on a business? First of all, there are important financial records, such as lists of debtors, without which any attempt at debt collection is useless. Secondly, there are stock records, which are time-consuming to replace if they still exist; and if they

The loss of personnel records can lead to all sorts of claims which might be difficult to contest

don't, it is almost impossible to prepare a decent insurance claim if the warehouse has burnt down. The loss of personnel records may be an embarrassment at best, but at worst their loss can lead to all sorts of claims which might be difficult to contest, such as merit rises, bonus payments, commissions and so on.

Lists of customers, sales records, the list is endless. The resilience of those companies who survive a

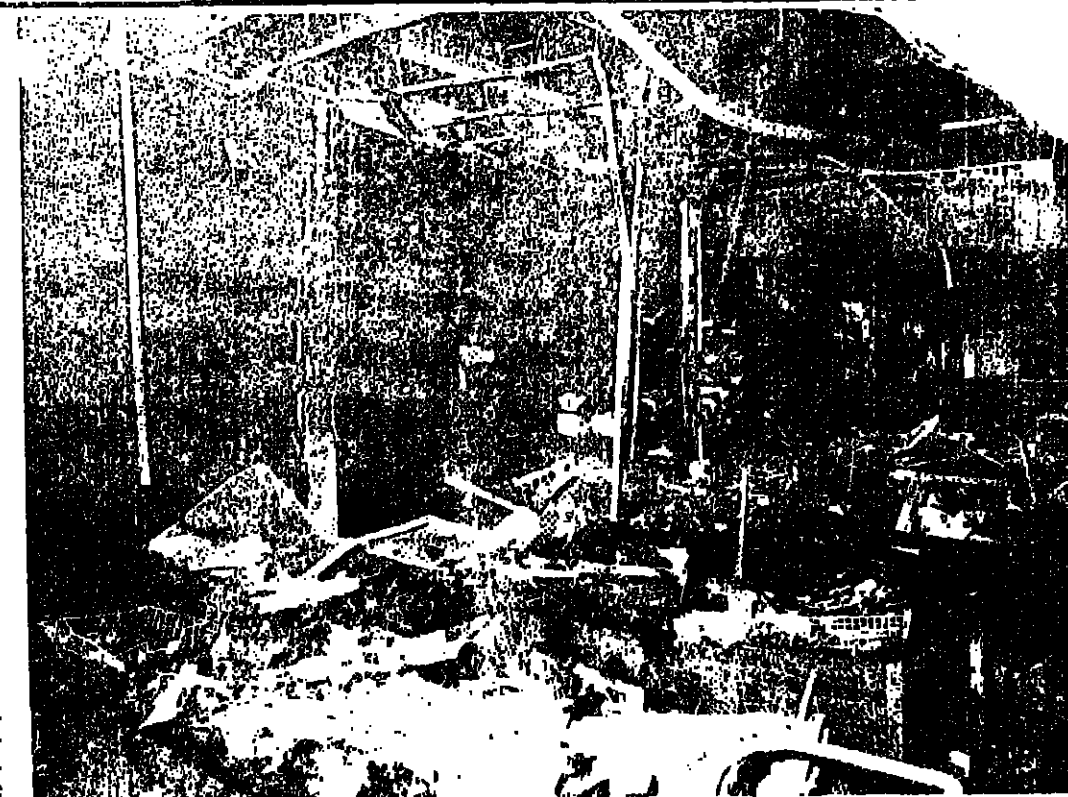
fire, or their foresight in being prepared, is admirable.

Paper is the easiest medium to protect from fire, as it obligingly only begins to char at 350 degrees F (176 degrees C) - although this is less than a quarter of the temperature of a major fire! Microfilm including microfilm, has a critical temperature of 150 degrees F (65.5 degrees C) and also suffers from problems of humidity.

Magnetic tape has the same critical temperature as microfilm, but the increasingly popular floppy disc has an even lower critical temperature, just 125 degrees F (52 degrees C), with the real risk of loss of information on the floppy disc at a humidity of just 85%.

Naturally, no one really cares much about the loss of paper, microfilm, or floppy disc alone - even though these are quite expensive. It is the information stored upon them which gives these items their value.

Firesafes are normally tested to cope with either a one hour or a two hour blaze, withstanding temperatures of up to 1,850 degrees F (1,010 degrees C). They must be able to withstand these high temperatures for the specified period without harm to their contents, and continue to protect their contents while being cooled by a fire hose and dropped 13 feet on to rubble to simulate the effect of a



Forty three per cent of companies suffering a fire go out of business.

floor collapsing in a building. Incidentally, after all of this abuse, one must still be able to open the safe!

Some companies also offer a free replacement safe if one is destroyed in a fire. Unfortunately, you can only use a firesafe once, because after doing what it was designed to do the safe is no longer usable. This is because the insulation is destroyed in protecting the contents.

A fire-resistant cabinet is not necessarily a second best solution in terms of fire protection. A reasonable minimum requirement is for the cabinet to be able to withstand temperatures of up to 1,700 degrees F (926 degrees C) for

one hour without damage to the contents, and sudden heating of up to 2,000 degrees F for 30 minutes without accumulating explosive gases within the cabinet. However, the cabinet is only a safeguard for paper.

It should be recognised that no material is completely resistant to fire, regardless of the intensity. For that matter, while so-called fire-resistant buildings can be built, wooden furniture and other materials, including paper, insulation and wiring, inside the building can be sufficient for a fire to gain a hold and generate considerable heat.

Fortunately, most fires pass their peak intensity in any one part

of the building within the tested time of a good firesafe, simply because there is little left to burn!

Some insurance companies now insist on adequate fire protection and certainly good fire protection is a form of insurance against the unthinkable. Insurance companies banks, credit card companies and building societies are among the organisations which seek to protect their future and that of their employees, members or shareholders.

By nature, such organisations are more security conscious, but this attitude is just as important for any business activity. Survival is the name of the game.

The author is general manager of Shannon Datastor.

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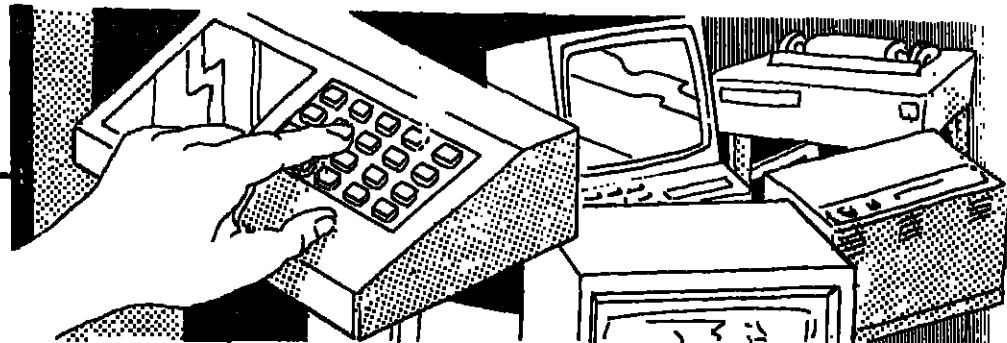
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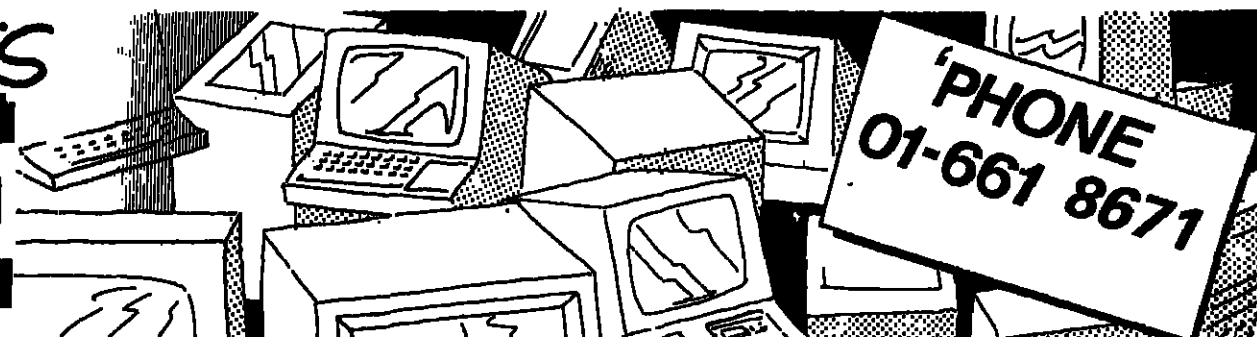
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Chilver appointed to Advisory Board for Research Councils

IN A move to forge closer links between government-financed basic and applied technology research and development, Sir Henry Chilver, new chairman of the Advisory Council for Applied Research and Development, has been appointed a member of the Advisory Board for the Research Councils, ABRC.

Chilver's appointment follows the government's new terms of reference for ACARD, an advisory body on all matters relating to applied research and development. These call for greater co-ordination between ACARD and ABRC to promote the application of government-funded research by industry.

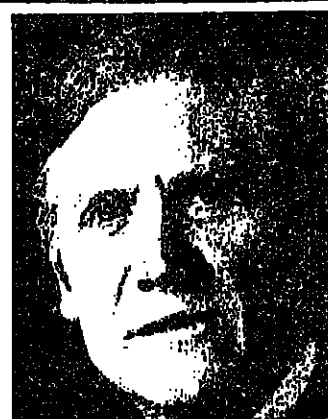
ABRC advises the government

on the allocation of the science budget - £482 million this year - among the UK's five research councils.

Commenting on his appointment to ABRC which runs to 1985, Chilver said that one of his main concerns would be to ensure that ACARD understands better the policies of the research councils. "My other main concern will be to find ways in which research, particularly relating to information technology, can be turned to practical reality by manufacturing industry," he said.

As a member of ABRC, Chilver succeeds Dr Alfred Spiak who died last year.

Vice-chancellor of Cranfield Institute of Technology since



Chilver

1970, Chilver's many government appointments have included the chairmanships of the Post Office from 1980 to 1981 and the Computer Board for the Universities and the Research Councils from 1975 to 1978.

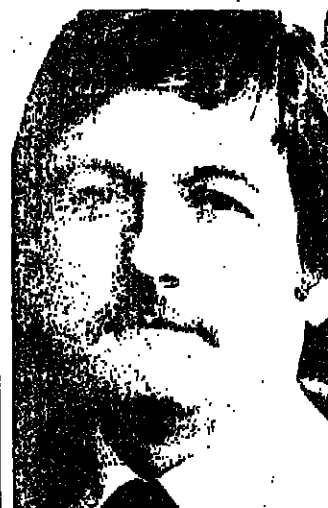
ABRC's membership includes the head of each of the research councils, chief scientists of government departments and independent academics and industrialists.

ITT forms office-comms division

ITT has formed an office information and communication systems division to be based in Cockfosters, North London. Chris James, formerly data communications manager with ITT Business Systems, has been named general manager of the new division.

As well as developing and marketing a new range of products for the information processing and communications market, the division will assume responsibility for ITT's BS message switching systems. The division will initially employ 100 people.

James has been with the company since 1977, when he joined as product marketing manager, data systems. He was promoted to data communications manager two years later.



John Bunce has been named managing director of Ericsson Information Systems. He has been with the company for one year as marketing director and was previously a regional manager for ICL in the Midlands. EIS was formed by Ericsson of Sweden and incorporates the former Dataaas operation.



Linda McAndrew has been appointed systems development manager at York-based Signal Word Processing. She will also assist with client training and familiarisation with Signal systems. She was previously a freelance systems and programming consultant working closely with IBM software houses.

'Micros in community' competition

YOUNG computer enthusiasts living in the North-east are being encouraged to channel their interests into a scheme that will benefit the community in a competition organised by the Harrogate Junior Chamber.

Non-professional analysts and programmers under the age of 19 are invited to submit a report of between 3,000 and 4,000 words, plus illustrations, describing a project in which a microcomputer can be used in the community.

Entries for the competition, sponsored by Systime close on September 18. Details from Robert Hopkins (0423) 67265.

■ Tony Sive has joined MSA as sales executive for the North-west. He was previously a sales consultant at Dataaid.

■ Raymond Coleby has been appointed manager, information systems, at Asda Stores. He was previously with Hepworths.

■ John Knight has become senior sales executive at Ferranti Computer Systems. He was previously a marketing executive for Walter Kidde.

■ Frederic Rappan has joined Portescap UK from Portescap Switzerland, where he was internal applications manager for the German-speaking market. He will be an internal sales engineer in the UK company.

■ Colin Stanley has been appointed chairman of the Computer Retailers Association. He is chairman of Britair Development Holdings, managing director of HB Compu-

ters and a director of Pegasus Software.

■ John Somerville is founding managing director of Saffronrose, a systems house based in Finchley, North London. He was previously with IBM in systems support roles for 10 years. After that he established computer services functions for Sea Containers Inc, which was followed by five years' management in Iran and two years as an independent consultant in the UK.

Marketing director is former NCR consultancy services and education manager Cliff Cockhill. Robert Gordon, previously an independent consultant in Saffronrose's sales director.

■ Geoff Morris and Mike Philpott have joined CAB Group sales team. Morris joins as area sales manager for teleprinter equipment and Philpott as a sales executive for general audio and data communications.

■ Desmond Cassidy and David Travers have been appointed executive directors of DPCE (Holdings), an independent computer maintenance company. They remain on the board of DPCE (UK), Cassidy as marketing director and Travers as operations director.

Harvey Tordoff, previously DPCE UK's financial controller and company secretary, becomes financial director of the company and Rodney Marshall, previously support services manager, becomes purchasing director.

■ Beverly Nuttall has joined Pete and Pam Computers as sales co-ordinator (France) from Salford University, where she graduated in French and English.

■ John Shenton, managing director of Peripheral Hardware, has moved the company's headquarters to the Monkpath Industrial Estate in the West Midlands.

DIARY

JULY 23
APL in education. UK APL User Group. Read Lecture Theatre, Imperial College of Science and Technology, South Kensington, London. 2.00. Details P. Goacher (03727) 21282.

JULY 26-28
Electronic image processing - international conference. IEE, University of York. Details IEE, 01-240 1871.

AUGUST 3
Data administration working party. BCS. Details David Sten-ton, 01-486 3947.

SEPTEMBER 23-24
Information systems - analysis and design working party. BCS. Open University, Milton Keynes. Details Guy Fitzgerald, 01-854 2030, ext 377.

CONFERENCE

■ A WORKSHOP in structured system design is being held by BS Applied Systems from August 24 at the Chatsworth Hotel in Worthing. The workshop has five days and is suitable for systems analysts, designers or programmers. Practical training in the techniques of structured system design will be given. The course is residential and costs £615 + VAT. Details from Sarah Wall on 01-361 9237.

■ TO assist operations managers produce timely, reliable, accurate and cost-effective information output, Frost and Sullivan has organised a seminar entitled 'The Effective Use of Computer Operations Management', scheduled for October 6-8 and to be held at London's Café Royale. Details from 104-112 Marylebone Lane, London W1 5FU. Tel: 01-486 8377.

BOOKS

Database developments assembled in a useful reference text

Practical Database for Major, Minor and Micro Computers. F. H. George and P. A. Sarker. Chiltern Educational and Time Sharing Services. 483pp. 1981.

In many areas of computing, applications of database technology have been slow in gaining momentum. This may have been because there has never been a full spectrum of database tools to enable the designer/programmer to exploit fully the available hardware.

However, the situation is rapidly changing. Database systems are now available not only on mainframes but on minis and micros. This book attempts to bring together some of the developments that have taken place in each of these areas.

Logically, the material in the book is sub-divided into two parts. The first introduces and explains some of the plethora of database terminology and concepts. The second deals with operational

systems and some of the various packages that are available commercially.

Most of the first section of the book is presented in terms of Codd's database philosophy - sets, records (owner and member), elementary items, DDL, DML and so on. The coverage of these topics is adequate and the chapters are well written. Unfortunately, controversies and DBMS implementation are less well covered and little mention is made of the relational database approach - even though two systems based on these ideas are described later in the book.

The second (major) section of the text is devoted to a description of operational systems. These are covered in terms of three groups: mainframe packages, minicomputer systems and database software for micros. Although the description is not comprehensive, most of the major product

offerings are included. For large computers there are descriptions of IDMS, DMS-90, DMS-1100, IDS, EDMS, System 2000, Adabas, IMS, Total and RDS (a relational system).

The first six chapters make reasonably pleasant reading, but the remaining 15 are less inviting since they contain a considerable amount of technical description. All of this is related to the specific systems outlined above. For this reason, the book might best be classified as a reference text rather than one for general reading.

In producing this book the authors have brought together a significant amount of material. Unfortunately, there are several spelling errors and the citations to data sources are poorly referenced. This would obviously prevent the reader from following up the material described in the text.

Philip Barker

US practices hold little that's new for the UK

Modern Programming Practices - A Report from Industry. Edit Robert Glass. Prentice-Hall International. 311pp. £16.45.

THE programming practices of the title are the software development methods of six major American firms. Glass has compiled the book from reports produced for the US Air Force computer procurement agency. His stated intention is to demonstrate industry practice as opposed to academic theory.

Many of these "modern" practices are well-known in the UK, although perhaps not widely employed. Here are old favourites like Top-Down Design, Structured Walkthroughs, Change Control, Chief Programmer Teams, Quality Assurance, and many more.

As the six reporting companies are giants in the field (Boeing Computer Services, Computer

Sciences, Martin-Marietta, Sperry Univac, System Development, and TRW Defence and Space Systems Group), it is understandable that they place rather more emphasis on software engineering techniques than the average UK installation.

Glass feels that "a vein of golden information" is present in the book. The mining simile is apt, as the reader has to dig deep to find anything of value. Despite the emphasis on practice, the book has an academic feel about it.

I cannot imagine who will read it, but certainly not the typical, hard-pressed DPM. I found it heavy going, with its American (Germanic) textbook prose style. The "rambling original words" are supposed to provide more insight, but for me they merely obscure the view. Unfortunately, extracts from dull reports only give rise to a dull anthology.

Alan Stewart

Micro book's big ambitions

Microcomputing. R. G. Anderson. Macdonald and Evans. 108pp. £1.95.

THERE seems to be a general agreement among publishers that any book on microcomputers should be micro-sized. But probably it is the micro user who is most in need of instruction and help. Though the book is small in size, the publishers of Microcomputing have far from micro ambitions, suggesting that the book will serve the needs of accountants, office managers, small business

users, administrators and students.

It is structured more for the academic than the practical businessman, and a casual reader could easily believe it was a primary Basic handbook for the Commodore Pet microcomputer.

Seen as a basic guide to Basic, and allowing for the low cost, the book provides a useful introduction to microcomputing - particularly if the reader happens to be a Pet user.

Alan Simpson



"I'd like to know how my name got on their mailing list."

Guide to WP systems

The International Word Processing Equipment and Software Guide 1982. Keith Wharton. Network Communications, Lightwater, Surrey. 165pp. £25.

UNLIKE general computing where the objective appears to be producing ever smaller processors and systems, the word processing industry seems intent on expanding rapidly in all directions. WP systems, once limited to a basic machine not much better than an advanced electronic typewriter, now embrace computer and communication technology.

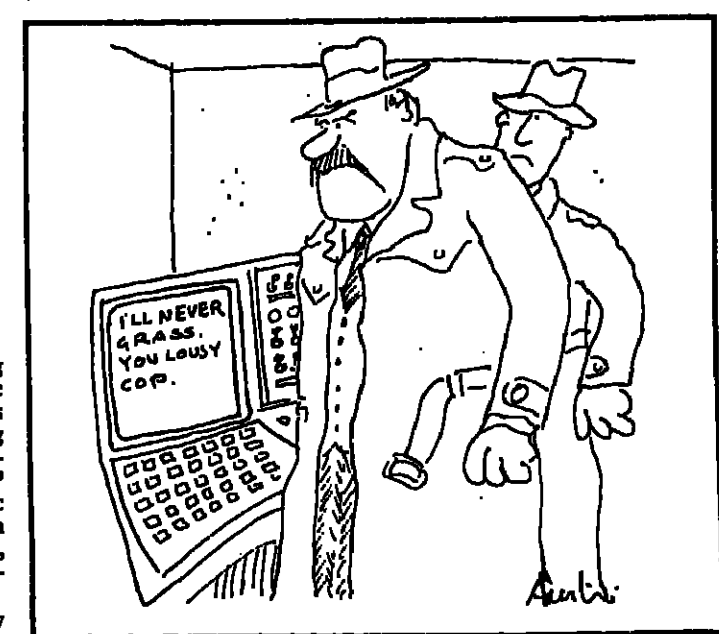
The prospective buyer is now expected to be able to determine between a WP cluster and network system and discuss such features as prompt menus, versatile maths facilities, typeface pitch, and line drawing programs - all of which options feature on the new ITT Scribe at a cost of £5,214.

At the other end of the WP price scale, Olivetti supplies a system at a cost of £2,195, with middle of the technology range supplier Digital providing systems ranging from £5,000 to £26,000.

Selecting, evaluating and implementing WP systems is a major feature of the latest Guide. Alongside comprehensive equipment listings are useful articles covering developing strategies for office automation, the performance of bureaux, facsimile and package software.

The Guide, which has become the established industry authority of everything to do with word processing, could well take a tip from the publishers of the equally authoritative Computer User's Year Book, and introduce colour pagination for the sections covering listing of suppliers and equipment.

Alan Simpson



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HARRIS QUEENSWAY is a rapidly expanding furniture and carpet retail organisation with branches throughout the U.K.

We have installed 4 HEWLETT-PACKARD 3000 computers, 3 located at our Head Office in Orpington Kent and 1 at our central carpet warehouse at Swanley, Kent. All 4 are linked together by use of DS/3000 SOFTWARE.

These systems support a variety of commercial work with extensive use of over 70 on-line Terminals.

We urgently require a person to be responsible for the day to day running of the machine rooms and the general supervision of 4 other operators. Applicants must have at least two years' experience of operating, preferably on a H.P. 3000 or similar mini computer, some supervisory experience would be preferred. No shift work is involved.

EXCELLENT CAREER PROSPECTS ARE OFFERED. Telephone Clifford Powell, Computer Operations Manager (quoting ref. OR 484)

on ORPINGTON (0689) 36977 or write giving career details to address below:

HARRIS QUEENSWAY GROUP PLC
HARRIS HOUSE
76 HIGH STREET
ORPINGTON
KENT



(0284)

DO YOU NEED TRAINED TECHNICIANS?

Twelve technicians with specialist knowledge and practical training in servicing microprocessor based systems will be seeking employment nationwide from August 1st year. Having completed a full-time M.S.C.-approved training course, they will be equipped with the skills to repair and maintain a wide range of microelectronic products and allied equipment.

For further information about the training or the trained persons, contact Les Thurogood or John Thorne at Blackpool and Fylde College, Ashfield Road, Blackpool. Tel: 0253 52362 Ext. 235.

ITN

COMPUTER GRAPHICS Programmers

Independent Television News seeks to recruit for its computer graphics team. The team will be responsible for the production of computer graphics for its news programmes. Other projects will include writing and testing special programmes such as elections, and developing graphics software.

Programming will be mainly in Pascal on a DEC VAX running under VMS. Because of the extremely short lead times, graphics preparation applicants should be able to produce graphics with minimum supervision.

Preference will be given to candidates with experience and an active interest in current affairs and graphics.

Salary, which is under review, will be in the range of £14,000 to £17,000 per annum (for those with previous experience) without delay to the Manager, Computer Graphics, Television News Ltd, 46 Wall Street, London EC4A 3DF.

The Computer Services Division in Swindon, Wiltshire of the House of Fraser

Embark on the construction of one of the most advanced digital networks in Europe

Honeywell, DPS 8, DPS 6's, Datanet 8's, DSA, DM IV, GCOS, ICL 2977, VME/B, IDMS.

Our client, the Computer Services Division of the House of Fraser plc, turnover £826m, is committed to a long term plan for the full computerisation of the group's business management systems using Open Network Architecture and Regional Databases to be connected by a Digital Network operating in real time.

Based on a Honeywell DPS 8 and a complex of DPS 6's, and Datanet 8's, via DSA and using IDS extensively, with links to a 6mb ICL 2977, the network will be designed to facilitate interfacing with a wide variety of minis and terminals located in the group's retail outlets and warehouses throughout the UK. The list of outlets is impressive and includes Army & Navy, Binn's, Dingles, Frasers, Harrods and Rackhams.

The Division is recently established in Dorcan in a spacious and superbly appointed purpose built complex. A full range of facilities is provided including a dining hall, staff rest room and games room. The site is served by local bus services and is within easy access to the M4 motorway.

Due to an increasing demand for computing facilities and services through the group, brought about by a realistic user management, a dynamic computer services management team, and the increasing availability of advanced communications, the Division is embarking on a long term development of a wide span of brand new on-line and real time merchandising, warehousing, distribution, credit accounting and financial systems.

To meet these far reaching development requirements our client seeks to recruit a number of data processing professionals of various backgrounds of experience into a range of new and exciting appointments.

Good starting salaries will be offered plus an appropriate range of unique and tangible benefits and privileges, including preferential shopping facilities with substantial discounts on all purchases at any store or outlet in the group, an established profit linked share scheme, generous pension scheme, and fully appropriate relocation expenses including pre-joining travel and overnight costs pertinent to viewing and finding accommodation.

All interviews will be held as appropriate during the week or on Saturdays on-site at Dorcan where you will meet the management team supported by BIS consultants who will provide every opportunity for viewing the facilities first hand and for ensuring all your questions and queries are fully answered.

Systems Analysts	c.£10,000	G1062/G
Analyst/Programmers	c.£9,500	G1062/H
Senior Programmers	c.£9,500	G1062/I
Programmers	c.£8,000	G1062/J

A number of key positions are available at all levels in a variety of applications areas.

The systems to be developed on the mainframes include a new Management Information System, a new Corporate Credit System, and a variety of other large self-contained systems for specific divisions in the group. All systems will incorporate a full utilisation of database methods.

The systems to be developed for the network will embrace the on-line credit sanctioning, real time stock control and merchandising systems, and the planned office automation facilities. A further activity is the transfer of information between trading units throughout the UK.

Mini computers are used in a number of stand alone real time applications typically in finance, insurance and stock control. Current vacancies include analyst/programmers and programmers on Datapoint ARC and ICL System 25.

All the systems will utilise advanced design methodology, and will provide a unique, exciting and absorbing challenge and secure tenure to those successful in applying.

Applications are invited from career minded systems and programming professionals with a minimum respectively of 3 years and 2 years relevant experience, and possessing some familiarity with the development of on-line and/or database systems, especially for the more senior posts. Whilst experience of a particular manufacturer's equipment is largely not relevant for the systems appointments, for the programming positions the relevant m/c exposure would be an advantage.

Senior Operators c.£8,000 (inc. shift allowance) G1062/K
You will have had 2 years experience in a Honeywell operations environment preferably with DPS 8 series equipment.

HOW TO APPLY

In the first instance all applicants are invited to send a ONE PAGE note (typed or hand written) covering the following brief details: name, address, daytime and home telephone numbers, systems and/or programming experience to date (as applicable), previous employers and positions held, relevant hardware experience, present employer, position and salary, and other relevant experience, or send a similarly constructed CV if available to the Data Processing Staff Recruitment Manager, quoting the RELEVANT REFERENCE NUMBER, at the address below. All applications will be dealt with promptly and in strict confidence. Providing sufficient information is listed as requested applicants will NOT be asked to complete application forms for the first interviews.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866



(0278)

Software Engineers

Up to £12,000
Hertfordshire

IDEC, a key systems development centre for ITT in Europe has, coincidentally with its consolidation of operations in a multi-million pound purpose-built office complex in Stevenage, entered a major phase of expansion based on a wide range of new high technology projects.

We are committed to excellence and innovation in the design and development of microprocessor-based communications systems, and the scope and variety of our work ensures opportunities for our staff which are second to none. Of course, we expect a lot in return. Not only will the successful applicants have a minimum of three years' experience in real-time systems development using high level languages, they will also have a sound understanding of communications technology covering such areas as Local Area

Networks, Public & Private Switching, Communicating Word Processors and Tele... Experience of IBM/Amdahl, PDP11, H.P. 1000, VAX machines and Intel 8000 series microprocessors would be an added advantage.

In addition to a very competitive salary we can offer such exceptional people a comprehensive range of valuable large company benefits which will fully reflect your qualifications and experience. And, of course, there will be plenty of scope to gain across-the-field experience in the latest software technology and you will be given every encouragement to develop your career within our international organisation.

Consider IDEC and phone Chris Turner on Stevenage (0438) 738020 or write to him with full career details at the address below:



The centre for tomorrow's communications technology
Six Hills House, London Road, Stevenage, Hertfordshire SG1 1YB. Telephone: Stevenage 726161

ITT - IDEC

ITT

in Stevenage

(023)

PROJECT MANAGER

CIRCA: £15½K + CAR

Our clients, a well-respected software house based in the City are seeking to employ a professional project manager who will take over the running of a number of individual project teams and act as an interface with their clients.

This position is regarded as an important appointment and applications are invited from candidates who have a strong data processing background coupled with a high level of commercial awareness. Previous experience with a software house would be an advantage but is by no means a prerequisite.

Our client works mainly on a variety of commercial systems and includes many well-known "blue chip" Companies amongst its past and present clients.

An excellent benefits package, a high salary and a company car are offered as reward for this highly challenging and interesting post.

For further information please ring Chris Morrow on 01-837 0451 quoting reference number RC14.



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LIMITED
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01-837 0451

(023)

CONSULTANTS

CITY

ATTRACTIVE 5 FIGURE SALARY

IMT is an established consultancy in the areas of IBM mainframes and online databases. Due to expansion of our services, opportunities exist for experienced consultants to contribute to a newly formed team with creative ideas.

Applicants, male or female, should have a minimum of 3 years' experience in a consultancy environment, and possess skills in:

- Feasibility studies
- System sizing
- Hardware selection
- Project management
- Database/Network design.

The ability to communicate effectively with both technical and senior management staff is important.

If you envisage yourself in a challenging role, please apply in confidence to Ralph Reed at the address below, giving details of your career to date.



Information Management Techniques
12 Vandy Street, London EC2. 01-377 4857



(023)

Mainframe Computer Field Engineers to £16,000 Tax Free Saudi Arabia

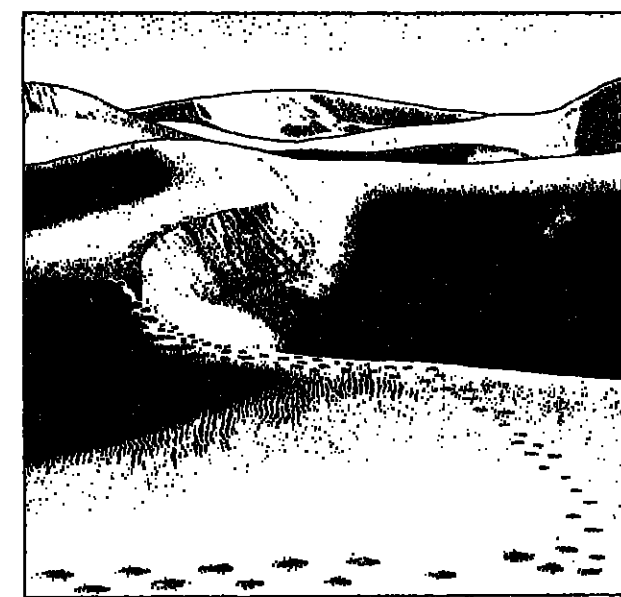
"The challenge is getting there, finding a fault and putting it right"

NCR Saudi Arabia have substantially improved their sales penetration during recent months, and now wish to recruit additional experienced field engineers to install and maintain customer owned equipment.

In recognising the importance of these requirements, we offer an attractive package including earnings of up to £16,000 per annum, free of income tax, with end of contract bonus, car allowance, medical coverage, furnished apartment and utility provisions, up to 45 days' annual holiday with regular return flights to the U.K. and excellent career opportunities.

The successful candidates are likely to offer a minimum of 4 years' experience in the maintenance of mainframe computer equipment including mag tape drives, disc drives, multiplexors, high speed printers and communications devices. An HND in

NCR



Electronics Engineering would be an advantage but it is less important than sound field experience preferably encompassing NCR products. The successful candidates will receive thorough training either in the UK or USA.

The appointments offer two or three year renewable contracts on bachelor status, although married status may be available in certain circumstances.

We have retained Capp Associates to answer your queries and to act on our behalf. Please write or telephone (24 hour answering service) to them, quoting ref: CW116-2F.

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DATABASE OR COMMUNICATIONS (IBM USEFUL) (Late Summer)
SENIOR CONSULTANTS (NOW)
UNIVAC FORTRAN (NOW)
MVS/PL1/JACKSON (NOW)
DOS COBOL CICS (July Aug Sept Start)
UNIVAC COBOL/DMS/TIP (NOW)
UNIVAC COBOL (NOW)
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01-553 2944 (4 lines) Emp. Agt.

(0205)

Senior Systems Analyst

Shepherd Building Group is a well established broadly based Group of Companies whose main activities include construction, the manufacture of portable accommodation and bulk handling equipment. A significant proportion of the Group's manufactured products are exported both directly and through overseas subsidiaries. The Group has some 4000 employees and an annual turnover in excess of £100 million.

We wish to recruit a Senior Systems Analyst who will report to the Systems and Programming Manager. The person appointed will be responsible for a variety of major data processing projects.

Considerable experience in database and on-line computer techniques is important. Applicants should be able to work independently and lead a project team and must be able to maintain good relations with all concerned and have the ability to communicate effectively with all levels of management. A degree or professional qualification, knowledge of V.L. equipment, particularly the ME29 computer, and the ability to program in COBOL would be an advantage but sound business knowledge and success in the practical application of data processing techniques are essential.

Located in the attractive City of York, a salary commensurate with ability and experience and a car allowance will be offered, together with assistance with relocation expenses, where appropriate. Benefits include a company pension and life assurance scheme. If you are interested and meet our requirements, please write initially with a copy of your curriculum vitae to Mr C. Mellis, Group Computer Services Manager, Shepherd Building Group Ltd, Blue Bridge Lane, York YO1 4AS.



Shepherd
Building
Group

Application Development, Analysis & Programming

To £20 000 p.a. Johannesburg, South Africa

A large South African organisation, with a well-established DP department seeks to strengthen its central application development function. Large ICL and CDC machines are operated at seven major installations and are interconnected by a data communication network supporting some 2,500 terminals. Hardware is presently being upgraded to new configurations, ranging from single 2958 to dual 2988 mainframes, all operating under VME. There is a heavy emphasis on transaction processing; major development tools include COBOL, TPMS, IDMS and related software such as Data Dictionary System. Our client seeks people who wish to build on their substantial experience within a challenging growth environment.

APPLICATION DEVELOPMENT

Opportunities exist for the full range of DP development staff, from programmers through systems analysts to project managers and design specialists.

SOFTWARE ANALYSTS AND SYSTEMS PROGRAMMERS

Experience in the VME operating system, data

communication software with low level languages is sought.

In addition to salaries negotiable up to £20 000 per annum, depending on experience, a full range of benefits will be provided for these permanent appointments, including

- Free air passage and a generous disturbance allowance.
- Subsidised mortgage.
- Medical aid and pension schemes.
- Extensive social and recreational facilities.

You will benefit from South Africa's high standard of living, its well developed economy, excellent facilities and beautiful climate.

Interviews will be conducted in the United Kingdom shortly, so please send a full curriculum vitae, by August 5th, 1982, quoting Ref. SA/01, to The Computer Consultant, c/o Austin Knight Ltd., London W1A 1DS.

Applications are forwarded to the client concerned. Therefore, any company in which you are not interested should be listed in a covering letter.

Austin
Knight
Advertising



(023)

COMPUTER OPERATIONS SUPERVISOR

Kendall Globe Limited are Travel Agents and Freight Forwarders with 200 employees and a current annual turnover of about £30 million. A period of considerable expansion is planned and the company is near to completing the computerisation of its accounting system, based on an ICL System Ten computer.

The company wishes to appoint a Computer Operations Supervisor for the following role:

1. To control, operate and maintain its ICL System Ten computer system, aided by one assistant.
2. To control modifications to the system and work on major system development projects.
3. To liaise fully with hardware suppliers and software contractors on problems with and enhancements to the system.
4. To schedule the flow of daily processing work and to liaise with the user sections in the control of documentation input and output from the computer.

Suitable candidates (male and female) with a minimum of 5 'O' levels, will have a substantial level of previous experience in operating computers for accounting systems - preferably ICL System Ten Computers. Age is not material but candidates must have had sufficient experience and authority for this key role working with an accounting function of about 30 people. A willingness to work regularly out of normal office hours is essential.

The salary is £8,300 p.a. plus non-contributory pension scheme and BUPA cover.

Applicants should submit full career details to date to: Mr A. R. Rosenberg, Financial Controller, Kendall Globe Limited, 35-37 Alfred Place, London WC1E 7DY.

(0283)

Systems Analysts/Analyst Programmers

Plessey Avionics and Communications is seeking to recruit a systems development team for its new generation of integrated business systems.

We require a development team leader and two analyst programmers with a minimum of two years' systems design experience in a manufacturing background which includes financial and commercial systems.

Experience of HP 3000, DEC VAX or other 'Minis' would be an advantage, with an ability to programme in COBOL and BASIC.

The successful candidates will be responsible for the detailed analysis of business requirements, the identification of problem areas and their solutions, and the detailed design, development and effective implementation of the resulting systems.

We offer the opportunity to play a major part in the restructuring of data processing within the company, competitive salaries depending on experience and qualifications, and usual large company benefits.

If you are interested, please send a full c.v. to: David Farndon, Resourcing Manager, Plessey Avionics and Communications, Vicarage Lane, Ilford, Essex, IG1 4AQ.



COMPUTER SYSTEMS SALESMEN

To service and expand dealer network in the following areas: North East, North West, Midlands and South West with South Wales.

Telephone in first instance: 0492 67288

(0288)

SOUTH COAST

If you'd like to know more about vacancies for Operations, Programming or Analysis in the South Coast area ring

Jeff Minards
The Managing Director of
GSA Recruitment
Bournemouth, Dorset BH2 9JH or at
home 01202/25111 or 01202/25111

(0206)

Analyst/Programmer for In-house systems to £10,000-£11,000 negotiable

Providing the computer systems needed to support WANG's immensely successful business operations in the UK is an exciting challenge in anyone's language. You will be a key member ensuring the smooth running of the company's internal commercial systems and will have the opportunity of applying new technology to applications. The job is based at our new UK headquarters in Isleworth, although occasional travel to other sites may be necessary.

Applicants, aged mid-20s and educated to at least 'A' level standard, require a minimum of 2/3 years' COBOL experience and

should have at least 6 months in an analysis role. Experience of WANG or IBM kit is preferable and on-line experience essential, as is an ability to relate to both computer professionals and non-technical staff within the company.

Benefits include pension, BUPA, free life assurance and Stock Purchase scheme. WANG is a fast-growing company and opportunities for career progression are exceptionally good.

Interested applicants should send full cv. to: Mary Gilligan, WANG (UK) Limited, WANG House, 661 London Road, Isleworth, Middx. TW7 4EH. Or telephone 01-560 4151 for an application form.

WANG

LEADERS IN OFFICE AUTOMATION

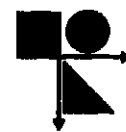
ACCOUNT MANAGER SOFTWARE PRODUCTS SALES

ADR, the largest systems software products company in the world, is seeking an experienced software products salesman to complete our team of Account Managers in the U.K. The person we seek will have a track record selling to the IBM mainframe market and will have been earning at least £20K per annum in the last two years.

The challenge is to sell ADR's unique range of Integrated Products including DATACOM, a relational database management system, and established industry leaders such as ROSCOE, VOLLIE and The LIBRARIAN.

The generous package includes a highly-gearred commission system, non-contributory pension, BUPA and company car.

To apply please telephone Carol Leckenby on Hitchin (0462) 56363 to arrange an interview.



APPLIED DATA RESEARCH LTD.
Portmill House,
37-40 Portmill Lane,
Hitchin, Herts.
SG5 1DJ

URGENTLY REQUIRED CONTRACTORS

ICL/IBM Snr Analysts-Programmers
NORTH WEST AND MIDLANDS



Contact: Philip Heath
Safe Computing Ltd
5th Floor, Bridge House
121 Smallbrook Queensway
Birmingham B5 4JP
Tel: 021-632 5111

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BARNLEY COLLEGE OF TECHNOLOGY
DEPARTMENT OF COMPUTING AND MICROELECTRONICS

Applicants are invited for the post of:

LECTURER II Computer Studies

Applicants should have recent experience of Business Systems/Systems Analysis and be able to teach COBOL, BASIC and Systems Analysis up to HNC level. Application forms and further particulars can be obtained from the Principal, College of Technology, Church Street, Barnley S70 2AN (SAE please) to be returned not later than 14 days from the appearance of this advertisement. (0328)

SUNDERLAND POLYTECHNIC
Faculty of Science
Department of Mathematics and Computer Studies
LECTURER II/SENIOR LECTURER IN COMPUTER STUDIES

Salary scale: L11 £8855-£10173 Bar - £11022 per annum
SL £10173-£11984 Bar - £12816 per annum

Applicants should preferably have an honours degree, or its equivalent, and business, commercial or research experience. The successful candidate will be expected to lecture up to honours degree level in his/her specialism. Interviews will be held in early September.

An application form and further particulars may be obtained from the Personnel Officer, Sunderland Polytechnic, Langham Tower, Ryhope Road, Sunderland, SR2 7EE or telephone Sunderland 78231, Ext 11. Closing date 5 August, 1982. (0288)

UNIVERSITY OF SURREY
Department of Educational Studies
(Computer Assisted Learning)
RESEARCH OFFICER

Applicants are invited for the post of Research Officer, Computer Assisted Learning within the Department of Educational Studies. The appointment is for 3 years and some experience of computing and an active interest in education are essential. Experience in the use of computers in Education and/or training would be an advantage. Work will be under the direction of Dr T. Hinton, who takes up the post of Director of Computer Assisted Learning in September, and from whom further particulars are available by telephoning Guildford 871281 extension 745.

Salary will be up to £5676 per annum on the Research and Academic IS Scale; superannuation will be under U.K.S.A. conditions.

Applications in the form of a curriculum vitae (2 copies) together with the names and addresses of two referees, should be sent to the Deputy Secretary (Personnel), University of Surrey, Guildford GU2 5XH, by 12th August, 1982, quoting reference 84/20. (0252)

RADIO TELEFIS EIREANN, THE IRISH NATIONAL BROADCASTING ORGANISATION, INVITES APPLICATIONS FOR THE POST OF:

SYSTEMS PROGRAMMER

APPLICANTS SHOULD HAVE A DETAILED KNOWLEDGE AND EXPERIENCE OF ICL'S 2900 OPERATIVE SYSTEM, SCL, SUPER-STRUCTURE PRODUCTS AND HARDWARE.

RTE OPERATES TWO ICL 2966 COMPUTERS. THE OPERATING SYSTEMS ARE DME2, VME 2900 AND CME. RTE ALSO USES IDMS AND IDMSX. WITH ICL'S DATA DICTIONARY SYSTEM, WORK LOADS ARE BOTH BATCH AND ON-LINE, WITH PROGRAMME DEVELOPMENT UNDER MAC.

THE POST IS A PERMANENT ONE, WITH A SALARY IN THE RANGE:

IR POUND 10,282 TO IR POUND 14,521 PER ANNUM (IR POUND 10,786 TO IR POUND 15,247 PER ANNUM (FROM 15TH SEPTEMBER 1982).

POSTCARDS: REQUESTING APPLICATION FORMS, SHOULD BE SENT TO: PERSONNEL ADMINISTRATION MANAGER, RADIO TELEFIS EIREANN, DONNYBROOK, DUBLIN 4 IRELAND

CLOSING DATE FOR RECEIPT OF COMPLETED APPLICATION FORMS - FRIDAY, 6TH AUGUST, 1982.

SENIOR PROJECT MANAGER CENTRAL LONDON £15-18,000 + BENEFITS

FINANCIAL APPLICATIONS DEVELOPMENT

Our Client is a major financial company utilising IBM 4341 mainframes and a large communications network. The vacancy is a newly created position which would be of interest to a person with a successful record of developing major applications including accounting or finance.

The person required will be responsible for planning and directing the efforts of a number of project teams developing a large accounting system with on-line data-capture and enquiry. Later phases of the project will integrate this system with the distributed processing network, extending to over 100 branch offices.

Whilst it is envisaged that applicants will have extensive systems and programming experience, managerial ability is a key consideration. The Senior Project Manager will be expected to play an important part in providing the company with increasingly sophisticated Data Processing systems. It is likely that the person required will be aged 30-45 and have at least 8 years' relevant experience, some of which will have been gained in IBM installations.

Conditions of employment and benefits are excellent including 28 days' Holiday, Non-Contributory Pension, Restaurant, Family BUPA Membership. After a qualifying period, there is an Annual Bonus and Staff Mortgage Scheme.

To apply or for further details, please contact SIMON BERRY or JASMINE DAINES in strictest confidence.



387 Euston Road London NW1 3AL

01-388 0111 (24 Hours) Licence No. 521A/3008

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0318

NORTH LONDON

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Car and usual benefits

The growth record of our Clients is spectacular. They are now a very well established and respected vendor of distributed data processing and electronic office systems with many prestigious clients in the U.K.

Applicants to this position should have a proven track record in pre and post sales support with emphasis on feasibility studies, proposals and presentations. Management experience is obviously beneficial.

As our Clients are also looking for several Pre/Post Sales Analysts, we encourage applications from candidates who may consider themselves "marginal" for the Manager's position. They could still be of interest in an initial non-management capacity with the opportunity for promotion and a very rewarding career.

Please contact in the strictest confidence BOB BOWER, ADVISING DIRECTOR.

Ref: CW2207/1

HUTTON EXECUTIVE SELECTION LTD.
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HUTTON STREET, LONDON EC4A 3BH

TELEPHONE: 01-253 7141 24 HOURS

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BANKING

W. LONDON IBM 4300

COBOL PROGRAMMERS SYSTEMS PROGRAMMERS

To £13,000 + Cheap mortgage and other banking benefits

This is an opportunity for Applications Programmers and Systems Programmers to enter banking, the area where the most sophisticated systems development is taking place, where long term career prospects are brightest and where the rewards are most generous, particularly with regard to fringe benefits.

APPLICATIONS PROGRAMMERS should have at least two years' IBM COBOL programming experience. Knowledge of real time transaction processing, database or financial systems would be an advantage.

SYSTEMS PROGRAMMERS should have at least two years' experience of some of the following: DOS/VSE, CICS, TSO, DATABASE, MVS, VM.

For further information, please contact MARK IRENS quoting reference CW2207/2.

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Real Time Mini Professionals: We need you

YESTERDAY! It's that urgent we find top pros with at least 4 years' Real Time Mini and/or Micro experience - on scientific, industrial, technical or MOD projects. We especially want you experienced in communications protocol - for example, X25 - and expert in digital exchange developments, particularly if you are also familiar with ITT System 1240. Rewards are sky high - but please get in fast! We also need software engineers experienced in graphic systems development and with good knowledge of ASSEMBLER or PASCAL.

AND TOMORROW - and tomorrow and tomorrow. We have an on-going demand for software engineers/programmers and designers all the way up to managerial and consultancy level. And for hardware designers.

Salaries from £8½k to £18k. Our clients are users, manufacturers, systems houses and consultancies in London and the Home Counties. Some top jobs going in Western Europe, too, *besonders wenn man ein bisschen Deutsch spricht*.

You're needed for:

- industrial control systems ● data acquisition
- communications (all kinds) ● radar systems
- command and control ● simulation ● office automation
- compilers and operating systems ● image processing
- military systems of all types.

Hardware: PDP11, VAX, DG Nova, HP, Argus 700, ITT, Intel, Zilog, for example - with relevant operating systems.

Languages: high and low level, including ASSEMBLER, MACRO, FORTRAN, CORAL, RTL2, PASCAL and C.

Fit in anywhere in this lot, and you'll get a warm welcome, any time of day or night, from Beryl McLaren on



01-836 9719 or 01-836 9882

Jupiter Computer Appointments

(REAL TIME MINI'S PLACE)

Suites 41/42, 12/13 Henrietta Street, London WC2

(0261)

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SENIOR SALES ACCOUNT MANAGER

£20,000 GUARANTEED

CAR & USUAL BENEFITS

Our clients are one of the largest manufacturers of EDP equipment in the world. Their range is very comprehensive from mainframes to micros with a heavy bias towards distributive systems. Clients in the U.K. number among the largest companies.

They seek an experienced, mature and successful Sales Executive to take responsibility for a portfolio of prestigious accounts in the North based on Manchester.

Good IBM experience is of importance as is a proven track record in dealing at very senior level and with large accounts in the financial/commercial sector.

Applications by telephone in the strictest confidence to BOB BOWER, ADVISING DIRECTOR.

Ref: CW2207/3

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4A 3BH

TELEPHONE: 01-253 7141 24 HOURS

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

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Coventry

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Our Client is a successful commercial Organisation and, as part of a commitment to distributed processing, is seeking to recruit an additional Software Programmer with around two years experience of minicomputer software. Ideally having a knowledge of RSX 11M and MACRO 11. The Software Programmer will join a small team currently engaged in the implementation of a new VAX 11/750 and the support of two PDP 11/70's and a PDP 11/34.

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103031

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SYSTEMS PROGRAMMER

Bath

Circa £8500 (under review)

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Wessex Water

03141

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For further details and an application form please contact (quoting ref. No. V40/82).

The Recruitment Officer,
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0268



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£10K-£11K

At the Royal Borough, we have a lively and professional D. P. Department. In addition to the financial systems found in any large organisation, we have a variety of interesting projects in service areas such as housing, libraries and social services. We are currently running an IBM 4341 using VMS/VS with DOS/VSE. An current projects involve on-line facilities using COBOL and are written in BASIC and operate on IBM 4341. A very high standard of work is expected from all our project teams and full training is provided in order to maintain these standards. We are looking for a Senior Programmer for one of our three teams to carry out the following duties:

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• Specification, code, test and document sub-programme
• Review programme work and provide advice and guidance
• Liaise with user department and co-ordinate staff during implementation and maintenance.

You should have four years' experience with at least two years' COBOL programming with COBOL and VMS/VS experience. In addition you should have a knowledge of the principles of modern office automation systems, including data communications, databases and an active sports and social club.

The Royal Borough of Kensington and Chelsea

Application forms quoting Ref. CM/718 can be obtained from: The Town Hall, Horton Street, London, W8 7NL. Tel: 01-837-5851 (24 hour answering service). Closing date: 1st August 1982. Applications are welcome from suitable qualified candidates, both sexes.

03089



University of London
Computer Centre

Systems Integration

The University of London Computer Centre provides a National Computer Service to universities throughout the country. The Centre is equipped with Control Data 7600, 6800, 6400 and Cyber 72 computers and has recently installed a 16 Mbytes Amdahl 470/V6 processor. A CRAY 1S processor will be installed in 1983 and can already be accessed at a separate location. A new Network Communications System is under development to support a large network of remote batch and keyboard terminals with access to other public and private networks. The Centre has adopted the X25, Triple X, FTP and JTMP communications standards.

The Centre wishes to recruit a programmer with at least 2 years' experience in programming on either large or mini computers. The successful applicant will join a team of systems programmers working on Systems Integration within the Operating Systems Department. Duties will include integration and testing methods and monitoring the reliability of the running production systems. Candidates with knowledge and/or interest in testing and maintaining Network Communications Systems software will be preferred.

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03171

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£8,500 plus £300 reading allowance.
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A senior reporter is needed to join a team of 16 journalists on Computer Weekly.

The ideal person would have proven journalistic skills as well as experience in the computer field. But lack of computing should not inhibit anyone with the energy and flair to hold down a senior reporter's job on a large weekly.

The successful candidate will be responsible for specific areas of coverage, including government and the trade unions, as well as general news reporting.

Computer Weekly circulates 100,000 copies, is based at Sutton, Surrey, and is a major title within IPC Business Press. It is the world's largest publisher of trade and technical journals. The computer publishing market is technical journals. Computer Weekly launched two ancillary publications and a number of exhibitions and conferences in the past year, and career opportunities reflect that.

Write to the Editor setting out your full cv, your job content over the last few years and your reasons for believing you are the right person for this position.

Address your letter to:

David Craver, The Editor, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey, SM2 6AS, and mark the envelope "Confidential".

All terms and conditions are in accordance with the IPC/NUJ Agreement.

We are an equal opportunity employer.

MERSEY REGIONAL HEALTH AUTHORITY

Mersey Regional Health Authority is planning to purchase a minicomputer to support a clinical booking system operating in real time and batch. It will support the available Software, La. ICL, Cobol and Plan. The system will be installed in Liverpool and requires to be delivered and commissioned by 1st December 1982.

Interested parties may apply for a full operational requirement by 6th August, 1982, to: Regional Supplies Officer, Mersey Regional Health Authority, 55 Castle Street, Liverpool L2 9TU.

0307

UNIVERSITY OF NEWCASTLE-UPON-TYNE DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

RESEARCH ASSOCIATE

VLSI Design Methodology Applications are invited for a temporary Research Associate post for a major research project on VLSI Design Methodology funded by the SERC and jointly managed by the Electrical and Electronic Engineering Department and the Computing Laboratory. The post includes the provision of a VAX 11/750 computer with advanced colour graphics facilities, a laser printer, a second generation computer aided design tools for very complex integrated circuits.

The post is available for a period of 12 months. Starting salary will be up to £8,000 per annum on the range 14 scale, £8,070-£10,575 per annum, according to age, qualifications and experience.

Applicants should send a curriculum vitae and the names and addresses of three referees to: Professor D. J. Kilham, Department of Electrical and Electronic Engineering, The University of Newcastle upon Tyne, NE1 7RU, from whom further details can be obtained. The closing date for receipt of applications is 20th August 1982.

0343

PSION

MICROCOMPUTER PROGRAMMERS & ANALYSTS

Psion is a rapidly growing microcomputer software house.

We require creative, skilled and able programmers and analysts. Applicants should have experience of assembly language and machine-code on one or more microprocessors. This is an exciting opportunity to work with a dedicated team in Central London in the fastest-growing area of computers.

Salary range £8,000 to £13,000 per annum depending on skill, experience and creative potential.

PSION LTD
2 Huntsworth Mews, Gloucester Place,
London NW1
Telephone: 01-723 6919 or 723 9408

103461

SOUTH WEST UNIVERSITIES REGIONAL COMPUTER CENTRE UNIVERSITY OF BATH

SOFTWARE DEVELOPMENT

Two programmers are required to join a small team developing a new compiler and related software for a major manufacturer. Experience of system software development (especially compiler internals) and a good knowledge of Pascal and/or Algol 68 would be a definite advantage, but equally important are enthusiasm, initiative and the ability to learn quickly.

Salary scales (under review):
IB (£5,285-£8,925), IA (£8,070-£10,575)

The appointments will be for an initial fixed term of two years.

Write or phone for further details and application form to:

Personnel Office, Bath University, BATH BA2 7AY (Bath 61244) ext 709, quoting ref no: 82/72. Closing date: 2.8.82.

0329

OPERATIONS

IBM MVS OPS ANALYST to £11,000
C.LONDON
As a result of continued major development, this prominent financial organisation is seeking to recruit an additional team member. The chosen candidate will possess an extensive operations background including proven experience in an MVS Technical Support role. Your prime responsibilities will be the implementation and maintenance of new systems, DASD management, system security, technical documentation and appraisal of software packages. In addition to an excellent starting salary commensurate with experience, a comprehensive benefits package is offered including sub. MORTGAGE and annual BONUS. Ref: J1358

RSX11M+ OPS/SENIOR OPS £20,000
CITY
We have been retained by a prestigious City-based financial organisation to assist in the recruitment of Senior Operations personnel. Applications are invited from ambitious, self-motivated individuals with an in-depth technical knowledge of RSX11M+, ICF and Utilities. The current hardware comprises an IBM 4300 mainframe (OS/VS1) and a rapidly expanding Communications Network utilising PDP equipment. In addition to full training and a high degree of job satisfaction, a superior range of benefits is offered including sub. MORTGAGE, annual BONUS and mileage allowance. Ref: J1354

IBM DOS SENIOR OPERATOR £20,000+
LONDON
A responsible individual with a good DOS VS Operations background and proven supervisory experience is required by this London-based commercial organisation. The chosen candidate, who should be fully conversant with DOS VS, JCL and Utilities, will be responsible for three staff on a DAYS ONLY basis. Ref: W1340

IBM MVS OPERATOR £7,000+
C.LONDON
This is an excellent opportunity for a self-motivated individual to join an established but progressive financial organisation. You should possess a minimum of 18 months' MVS experience and a good working knowledge of JCL and IBM Utilities. Current hardware comprises an IBM 4300 mainframe running on a two-shift system. Ref: W1353

IBM DOS VSE OPERATOR £5,000
C.LONDON
Six months' DOS VSE experience is required to join this major financial concern. Current hardware comprises IBM 4300 equipment running on an interesting "continuous shift" basis. Wide range of benefits including sub. MORTGAGE and annual BONUS. Ref: J1354

TANDEM OPS ANALYST to £11K
ONLINE experience essential in Technical Support role. London. Ref: J1358

DOS OPS ANALYST £10K
Extensive Operations/Technical Support background required. C. London. Ref: J1306

UNIVAC SHIFT LEADER £7,500
Two years' Univac 1100 and knowledge of Comma/Utilities. 2-shift. City at present - relocating to Northants 1984. Ref: P1337

ICL ME29 OPERATOR £6,500+
Eighteen months' ME29 or 2003/4 experience. 2-shift. City. Ref: P1350

DEC-VAX OPERATOR £6,500
Six months' VMS experience. 4-shift. C. London. Ref: P1380

IBM SYS 34 SENIOR OP £6K
Three years' System 34 exp. plus basic knowledge of RPG, DAYS ONLY. Midlands - relocating to Bucks 1983. Ref: P1361

COMPUTER TWO THOUSAND LTD
D.P. Recruitment Consultants
217-218 Tottenham Court Road
London W1P 9AF
Tel: 01-636 7584 (24 hrs)
(0351)

WARRINGTON BOROUGH COUNCIL
BOROUGH TREASURER'S DEPARTMENT
(COMPUTER SECTION)

SYSTEMS ANALYST/ PROGRAMMER GRADE S01/2

(£8190-£9268)
Salary Award Pending

The person appointed will be required to assist in the development of new systems and the maintenance of current applications. At least three years' experience of COBOL programming is essential and some experience of systems analysis would be desirable.

The Council's Computer is an ICL 2950 running under DME and GEORGE 2+ operating system. Mainframe is used as a program development aid. A wide range of financial and technical applications are run with on-line facilities being provided on a number of systems.

COMPUTER PROGRAMMER GRADE AP4/5

(£8501-£7875)
Salary Award Pending

Applications are invited for the above post within the Computer Section of the Borough Treasurer's Department. Previous experience of at least 2 years in COBOL is essential and a knowledge of ICL Software would be an advantage. The commencing salary will depend upon qualifications and experience.

The Borough's installation is at present an ICL 2950 running a wide range of systems for the Authority. A comprehensive development plan has been drawn up and there is a rapid expansion of on-line facilities currently in progress. Previous applicants for Computer Programmer post need not reapply.

Application forms and job descriptions may be obtained from the Personnel and Management Services Officer, Warrington Borough Council, Town Hall, Warrington (Tel: Warrington 35961 Ext 32), to whom completed forms should be returned by 8 August 1982. (0340)

CAD/CAM SALES EXECUTIVE

PND 25,000 + (ON TARGET)

Applied Research of Cambridge, a market leader in CAD/CAM systems wishes to appoint a sales executive to handle its activities in the southern half of England.

The successful candidate can expect to receive gross earnings in excess of PND25,000 - there is no upper limit. Applicants should have sales experience in interactive graphics or EDP. They must be able to demonstrate the ability to handle contracts, mainly in architectural, industrial and engineering markets, from initial enquiry to final agreement.

Write to:-
Recruitment Officer, Applied Research of Cambridge Ltd., 4 Jesus Lane, Cambridge, CB5 8BA.
Enclosing details of qualifications and experience. (0358)

SYSTEMS ANALYST/PROGRAMMER

HERTS. CIRCA £10K - To join a small team at middle management level, in the analysis and design of new systems, on two mini-computer systems. Age 25-40, with 2/3 years exp. of programming pref. on ASSEMBLER, gained in a commercial environment and 12 months' analysis exp., with at least 1 major project implemented. Substantive package including: Relocation assistance, company pension scheme, 5 weeks' annual leave.

Call and c.v.s to:
Paul Curley on 061-236 3342
C.R.C. Recruitment Ltd.
2nd Floor, Canada House, Chepstowe St., Manchester (0332)

MARKIV

COBOL + MVS + ONLINE

Program development preferably TSO
IMMEDIATE CONTRACTS in Central London
£2400/wk.

need Programmers with
3 years' plus experience with
18-24 months MARK IV

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01-661 0121

SALES EXECUTIVES

SALES EXECUTIVES - MICROS & MINIS

Good prospects with a major UK supplier to cover Greater London area. Basic to £8k. Car

SALES EXECUTIVES - BUREAU & S.W.

Reliability and security offered by large supplier of bureau, turnkey, SW and consultancy services. Basic neg. Car (automatic). to £20k

SALES EXECUTIVES - SUPER MICROS

To sell Super Micro Networks. Based in London. Basic to £10k Guar. to £20k

PRODUCT MANAGERS - PERIPHERALS

Large American Multi National has vacancies for European Marketing Managers. High basic salary. Fringe benefits. Car.

SALES EXECUTIVES - MINIS

Major International Manufacturer requires experienced Sales Executives for West London. High basic. Car

Plus many other good sales vacancies.
Telephone for an appointment.

SDS CONSULTANTS

COMPUTER PERSONNEL CONSULTANTS
AFTER 7.30 p.m. & WEEKENDS 0444 458804
150 Regent Street
London W1R 6FA
Tel: 01-439 6288

CUMBRIA COUNTY COUNCIL
BARROW-IN-FURNESS
COLLEGE OF FURTHER
EDUCATION

APPOINTMENT OF COMPUTER MANAGER

Salary range: £8,180-£8,733 per annum.

Applications are invited from men and women for the post of Computer Manager at the College. This is a newly established post in the College and the post holder will report directly to the Vice-Principal.

The post covers the functions of operations control, systems analysis and programming. Applicants should preferably have two years' computing experience with mini-based systems running BASIC.

Application forms are available from:
The Vice-Principal,
Barrow-in-Furness College of Further Education,
Howard Street,
Barrow-in-Furness,
Cumbria LA14 1LU

Telephone no. (0229) 26017 to whom completed application forms should be returned by Friday, 6th August 1982. 0312

UNIQUE ADVANCEMENT OPPORTUNITY

For a senior
ANALYST/PROGRAMMER

preferably in Database, to join a small software house specialising in City transactions. Salary negotiable plus bonus.
Send C.V. to 18 Adelaide Close,
Barnmore, Middlesex. 0210

Municipal Buildings
STIRLING

STIRLING DISTRICT COUNCIL
FINANCE DEPARTMENT

SENIOR ANALYST PROGRAMMER (APV-POI £8,733-£10,598)

ANALYST/ PROGRAMMER (APIV £7,620-£8,468)

(Salary Award Due July, 1982)

Applications are invited for the above new positions in the Finance Department.

The Council operates a disk based Honeywell Level 62 and extensive use is made of EQUAL software. A replacement DPS4 processor is due in August 1982.

Major systems are planned for implementation over the next few years and the currently small section has to be expanded to meet council requirements.

Applicants for the senior post should have a minimum of 5 years' experience in analysis and programming, preferably with Local Government and Honeywell background. The successful candidate will be expected to take responsibility in a supervisory capacity.

Applicants for the post of Analyst/Programmer should have 3 years' experience and Local Government/Honeywell background would be an advantage. Commencing salaries will be according to qualifications and experience.

N.C. Conditions of Service apply and assistance may be given with removal and relocation expenses.
For application form and Job Description contact:
Director of Finance
Municipal Buildings
STIRLING
FK8 2HU

(or telephone Mrs Fisher at Stirling 3131 Extension 218)
Completed forms should be returned to the above address not later than 6/8/82. D. M. Boyd
Chief Executive Officer

ANALYST/PROGRAMMER (MINI SYSTEMS)

N. LONDON TO £9K + CAR

An attractive opportunity exists for an experienced Analyst/Programmer who has been primarily involved in interactive systems. Based ideally on DG Nova using Cobol.

The successful candidate should have at least 2 years' experience where his/her role has encompassed design, programming and support.

To discuss this position in more detail, contact Shirley Francis quoting ref: 6174 on the number below.

LLOYD CHAPMAN ASSOCIATES
01-499 7761

EXCELLENT CONTRACTING OPPORTUNITIES

Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our permanent or contract staff, please contact us in respect of these and future opportunities.

INTERNATIONAL

PL/1 CICS ICL 2900 S/36, RPB 111 COBOL or PL/1 IMS DB/DC COBOL, CICS and/or ADABAS MARK IV	Programmers All Levels Programmers/Analyst Programmers Analysts Programmer Analysts Analyst Programmer	USA Belgium Europe USA USA Paris/USA
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UK

COBOL, IMS/DB and/or IMS/DC COBOL/DBS COBOL, CICS DL/1 RPB 111, S/36 RPB11, DOS or COBOL Rediffon COBOL, HP3000 COBOL, ADABAS MARK IV	Project Leader Programmer Analyst Programmers Project Leaders Programmers Programmer Analyst	Home Counties Home Counties Home Counties Home Counties London
PRIME NOMAND	Programmer Analyst Programmer Analyst Programmer Analyst Programmer Analyst	Home Counties London London Home Counties
	Team Leader Programmers Analyst/Programmer	London Home Counties

For more information please contact:

Resources Department
TANGENT COMPUTER SERVICES
102/100 South Street
Romford, Essex
Tel: Romford (0708) 750201
(24-hour answering service)
(0308)

ANALYST/PROGRAMMERS

CITY/SEAS
Opportunities occur at various levels for persons with good BASIC, BASIC+ and/or C programming backgrounds to join a rapidly expanding International Systems House and Consultancy. Excellent careers are available in the development and maintenance of Banking Systems, Data Communications or Message Switching systems in London, America or the Middle East. Applicants should have experience of DEC hardware and software knowledge which includes exposure to communications working. An attractive salary range, dependent on experience and location and reviewed at 6 monthly intervals is supplemented by a generous company benefits package. Ref C4015

ALL LEVELS

CENTRAL LONDON to £12,000
The London Insurance sector is currently the source of a number of opportunities for Systems and Programming Staff wishing for a change in the direction of their careers. We have identified a number of positions available to PROGRAMMERS, ANALYST PROGRAMMERS, DESIGNERS and SYSTEMS ANALYSTS with IBM programming backgrounds in COBOL, PL/1 or RPG. Exposure to on-line or Database systems will be an advantage but is not necessary in all cases. These are largely development positions and the companies involved all offer excellent facilities for advancement and benefits packages which in some cases include MORTGAGE arrangements. Ref R3803

SYSTEMS ANALYSTS

SURREY £12,000
Two leading companies in the financial sector based in Surrey are actively looking for SYSTEMS ANALYSTS to assist with the development of sophisticated new systems on IBM equipment. Candidates will have had experience in designing and installing systems perhaps using structured methods in a banking, insurance or allied environment. The opportunities for advancement and career progression are excellent. The successful candidates will be offered excellent promotional prospects. The salary will be circa £10,000 p.a. with excellent insurance company benefits available, and a very pleasant environment in which to work, and perhaps live. Ref R3848/77

ANALYST/PROGRAMMERS

KENT £10,000+BENEFITS
Insurance Company in South West Kent are embarking on a major expansion programme. For this reason they are looking for 2 ANALYST/PROGRAMMERS. The company utilises an IBM SYSTEM 38, therefore candidates would have a knowledge of IBM GSD equipment, and also RPG II or III expertise. There will be much development work, and the opportunity to alter, amend and improve existing systems. The two successful candidates will be key members of a new team, and will be offered excellent promotional prospects. The salary will be circa £10,000 p.a. with excellent insurance company benefits available, and a very pleasant environment in which to work, and perhaps live. Ref S4003

ANALYSTS & PROGRAMMERS

MIDDLESEX £NEG
Our client, heavily committed to the development and implementation of new financial systems involving both large ICL 2900 and new, advanced mini-computers is seeking for Analysts and Programmers at all levels to join their team. We would be interested in hearing from persons with an ICL Systems and/or Programming background which has included either VME exposure or the use of mini-computers in a COBOL, BASIC or PL/1 environment. These are excellent opportunities that involve a high degree of user contact, use of the very latest techniques and a good career path commensurate with a very attractive salary range. Ref C3878

VARIOUS LEVELS

LONDON/HOME COUNTIES £HIGH
We require ALL LEVELS of IBM GSD professionals to fill our current vacancies. These positions range from JUNIOR PROGRAMMERS to SENIOR SYSTEMS ANALYSTS. In a wide range of companies which include Banks, Software Houses, Insurance companies and Computer Bureaux. Therefore, if you would like a change of position, and a very wide range of options, then contact us for further details of these excellent opportunities. Ref S3001

TCR

Targa Computer Recruitment
6 Liverpool Street London EC2M 7NH Telephone 01-283 9941 Telex 894858



David Grove Associates Bank Personnel Recruitment

We have an extensive banking clientele in the City and current computer recruitment requirements include the following:-

ANALYST/PROGRAMMER IBM 34, RPGII, International Merchant Bank, KAPITI exp useful.	£12,000
ANALYST/PROGRAMMER UNIVAC, COBOL, for reputable Merchant Bank	£Neg
PROGRAMMER/ANALYST IBM 34, RPGII, Merchant Bank, subsidiary of Clearing Bank.	£9,500
SNR PROGRAMMER IBM, COBOL, substantial International Merchant Bank requires experience in design of banking systems.	£11,000
PROGRAMMER IBM 34, RPGII, prestigious International Bank.	£9,500
PROGRAMMER IBM 34, RPGII, International Bank, new installation.	£9,000
OPERATOR NCR, IRX/IMOS, International Bank.	£6,000
TELECOMPUTER OPERATOR (Non-bank) New Machine, training given.	£5,500
SHORT TERM CONTRACT SENIOR ANALYST/PROGRAMMER, IBM 34, RPGII, European Bank.	

All permanent banking positions attract cheap mortgage and other benefits in addition to quoted salaries.
For more information about the above appointments and others, please contact BEVERLY COLLINS on 01-236 7961.

David Grove Associates 60 Cheapside London EC2V 6AX
Tel: 01-248 1858

SOFTWARE ENGINEERS

New product development in Scotland

Just see what the future holds for you at NCR—the world's second largest computer company and the leading supplier of Self Service Financial Terminals to banks and financial institutions both in the UK and worldwide.

Five major new products under development in an expanding engineering group have created a number of job opportunities for systems software specialists to develop and implement advanced micro processor terminal systems and mini-computer applications. You will join one of our project teams developing:

- terminal control operating software
- micro processor controlled devices
- communications network software
- system generation, distribution & debug utilities

That's what we expect from you; here's what we've got to offer in return:

- * Opportunities at senior level and all the way down to fairly recent graduates.
- * An organised structure of career development that gives fast advancement to talented individuals.
- * Salaries and benefits that are amongst the most competitive in the business, including a generous relocation package.
- * A healthy lifestyle for you and your family—golf, walking, sailing, skiing and all other social amenities close at hand.
- * Good quality, reasonably priced housing available in many different locations—and no traffic jams on the way to or from work.

If that's what your appetite and you'd like to know more about what NCR and Tayside (on the beautiful East Coast of Scotland) have to offer, then phone or write to:

Ian Hume, Manager-Employee Relations,
NCR (Manufacturing) Ltd., Kingsway West,
Dundee, Scotland.
Tel Dundee (0382) 60151
It could be the first step to a new and more rewarding life.



WEST COUNTRY AND SOUTH WALES

BRISTOL/AVON

ANALYST/PROG	IBM CICS DL1	c £9K
ANALYST/PROG	DEC PDP BASIC/DIBOL	ENEK
ANALYST/PROG	IBM COBOL	to £9K
PROGRAMMERS	HONEYWELL COBOL	c £8 1/2K
PROGRAMMERS	ICL COBOL	to £8K
SUPPORT ANALYST	PRE/POST SALES	c £10K + car
SYSTEMS ANALYST	COMMERCIAL	c £10 1/2K

GLOUCESTERSHIRE

SENIOR ANALYST	IBM	ENEK
ANALYST/PROG	IBM COBOL CICS	c £8K
ANALYST/PROG	ICL COBOL	c £8 1/2K
PROGRAMMERS	PL1 MVS IMS	£6-8K
PROGRAMMERS	IBM COBOL CICS DL1	£6-8K
PROGRAMMERS	IBM COBOL MVS	ENEK
PROGRAMMERS	ICL COBOL IDMS	ENEK
SOFTWARE ENGS	MINI/MICRO COMMS	c £11K

WILTSHIRE

SYSTEMS ANALYST	ICL 2900 VME/BIDMS	£8-9K
ANALYST/PROG	HONEYWELL COBOL	c £8K
PROGRAMMERS	HONEYWELL COBOL SCREENWRITE	c £10K
PROGRAMMERS	DEC PDP BASIC +	c £8 1/2K
PROGRAMMERS	ICL 2900 COBOL	c £7K
PROGRAMMERS	UNIVAC V77 COBOL	ENEK
PROGRAMMERS	IBM SYST 34 RPG II	c £7K
SOFTWARE ENGS	ASSEMBLER/CORAL/PASCAL	ENEK

HAMPSHIRE

SYSTEMS ANALYST	FINANCIAL OR INSURANCE	c £10K
SYSTEMS ANALYST	IBM MANUFACTURING	c £9 1/2K
SYSTEMS ANALYST	IBM PRODUCTION CONTROL	c £8K
ANALYST/PROG	TANDEM COBOL	to £9K
PROGRAMMERS	UNIVAC 1100 COBOL	£7-9K
PROGRAMMERS	HONEYWELL COBOL IDS 2 DM 4	ENEK
PROGRAMMERS	IBM COBOL CICS DL1	c £8 1/2K
PROGRAMMERS	IBM SYST 34 RPG II or III	to £9K
PROGRAMMERS	COBOL JACKSON STRUCTURED	to £9K
TPS PROGRAMMERS	SUPPORT ICL TPS SYSTEM	ENEK

DORSET/DEVON/SOMERSET

TEAM LEADER	PROJECT CONTROL BASIC +	c £11K
SYSTEMS ANALYST	FINANCIAL INSTITUTION	c £10K
SYS PROGRAMMER	SUPPORT MVS SYSTEM	ENEK
CUSTOMER SUPPORT	2 Years BASIC (DEC/WANG)	ENEK
PROGRAMMERS	IBM COBOL/ASSEMBLER	£7-9K
PROGRAMMERS	ASSEMBLER/CORAL/PASCAL	c £9 1/2K
PROGRAMMERS	IBM SYST 34 RPG II	c £8K
PROGRAMMERS	CMC BASIC	ENEK

SOUTH WALES

SYSTEMS ANALYST	IMS TSD PROG Background	c £9K
SYSTEMS ANALYST	ICL Junior Level	ENEK
ANALYST/PROG	IBM COBOL CICS	c £8 1/2K
PROGRAMMERS	IBM COBOL IMS	to £8 1/2K
SYSTEMS ENG	ENG Graduate FORTRAN ON LINE	c £10K
COMMS DESIGNER	ENG Graduate ASSEMBLER	c £10K

Sanderson

For further information regarding these and many other vacancies available in the West Country, contact Sandersons Computer Recruitment, 41-43 Baldwin Street, Bristol 1. Tel. (0272) 211741.

COMPUTER RECRUITMENT
Tel: (0272) 211741/4



ADVANCED TECHNICAL SERVICES

TELECOMMUNICATIONS EXPERTS

UP TO £28,000 INCLUSIVE

SWITZERLAND & ITALY

Our client, one of the foremost telecommunications companies in Europe, are looking for a number of people to work either in Switzerland or Italy. To qualify for a position in Switzerland you should have several years of in-depth telecommunications expertise in quality assurance or similar, preferably on Vax equipment. You must also speak fluent German. To work in Italy you must have had experience of either ITT System 12/40 or network 2000. Systems engineering experience on either of these machines could be useful. Italian is not necessary in this case. These are super opportunities to widen your experience and gain the benefits of working abroad.

SYSTEMS ANALYSTS/LECTURERS c £11,000 BERKSHIRE

If you are a really experienced Systems Analyst with experience of VME and/or DME or TPMS or indeed any other TP monitor and you are looking for a change, this could be your opportunity. Our client is looking for people who would like to use their DP knowledge and communications skills to train people to become effective Systems Analysts. Call for further details!

SENIOR SYSTEMS ANALYST £11,500 SURREY

Ideally applicants should have minimum four years' analysis on IBM equipment, under DOS or DOS/VSE and CICS. Programming background advantageous but not essential. Applicants must have done major project from implementation to support. Applications include sales, purchase and nominal ledgers. You will also be required to deputise for Project Manager. Excellent career prospects and fringe benefits.

PROGRAMMERS £8,000-£12,000 LONDON & HOME COUNTIES

CALLING ALL IBM COBOL PROGRAMMERS
If you have a minimum of two years' experience under DOS/DOS VSE, with or without CICS, our client would like to hear from you. VM/CMS or DL1 would be an added bonus. We offer a large selection of interesting positions, high salaries and perks.

PROGRAMMER/TEAM LEADER c £11,000 LONDON

Our client wishes to recruit a DP professional with five years' programming experience which should include some IBM Cobol, also writing program specifications on large machines. Previous supervisory experience is essential, along with Database, On-Line Systems and Modular Programming techniques, to take charge of a significant development team and existing systems.

**BIREN HOUSE
64 WILTON ROAD
LONDON SW1V 1DE
TEL. 01-828 5792 (24 HOURS)**

HEWLETT-PACKARD OPPORTUNITIES

Due to the rapid expansion of the HP sector we have many clients, some of whom are first time users, seeking to recruit experienced programmers and analysts. Obviously HP experience is preferable but not a prerequisite as some users are prepared to retrain.

ANALYST/PROGRAMMER W. LONDON to £11,000
International company based in West London seeks an experienced analyst/programmer to join their development team. The successful candidate will eventually take over the project and be responsible for all maintenance and development. Applicants must have 3 years Cobol including some HP experience and knowledge of IMAGE database.

SENIOR ANALYST/PROG HOME COUNTIES to £12,000
Installation based West of London with a heavy commitment to DP requires a senior analyst/programmer to join their expanding department. Applicants should have around 4 years experience gained preferably on HP equipment although other manufacturers would be considered, especially if on line and database techniques have been deployed. Excellent career prospects are offered along with all large company benefits.

ANALYST/PROGRAMMER LONDON c £9,000
Software house has requirement for programmers and analyst/programmers to work in either their UK or International project teams. The minimum requirement is 2 years HP Cobol gained in any commercial environment.

ANALYST/PROGRAMMER SURREY c £9,000
Manufacturing company utilising a HP 3000 with a possible upgrade in the near future requires an analyst/programmer to join their small team. Applicants should have in excess of 2 years experience gained in any commercial environment as training on HP systems and software will be given where necessary.

PROGRAMMERS LONDON c £8,000
International financial concern seeks programmers with around 18 months commercial COBOL experience. Applicants with a good academic background are preferred and in return training will be given on HP equipment. For the successful candidate there will be quick progression to senior programmer levels. Perks include annual bonus, subsidised mortgage and some overseas travel.

ANALYST/PROGRAMMER LONDON c £9,500
Small but expanding HP 3000 site seeks an analyst/programmer to join their team. The successful candidate will be involved in development of new systems and possibly assume a management role in the near future.

This is just a small selection of current requirements; for details of these and others not advertised call us now.

APEX COMPUTER RECRUITMENT LTD.

Apex

LONDON OFFICE
58 Gresham Road
London WC1X 8TL
Tel: 01-404 4821 24 hrs

BRUSSELS OFFICE
Rue Gatti de Clamond
Uccle 1050 Brussels
Tel: 010 322-577 49-9

TELECOMMUNICATIONS ANALYST EUROPE c\$30,000

We have been retained by a leading International Financial Concern with extensive representation in Europe to assist in the recruitment of a Telecommunications Analyst to be based within Europe.

The ideal candidate will possess the following:

- 5-10 years broad experience of the Telecommunications industry, encompassing Data/Voice and Message Switching facilities.
- Working knowledge of international PTT regulations and CCITT recommendations.
- Familiarity with time division and statistical multiplexing techniques, data encryption standards and digital exchanges.
- Implementation of new and in-hand communications facilities.
- To act as project engineer for enhancements to user demonstration facilities.
- To support and liaise with regional branches on day-to-day basis.

In addition to the excellent salary, a generous and comprehensive benefit package is offered in respect of this position.

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KCC Ltd KEY COMPUTER CONSULTANTS LTD
ROYALTY HOUSE, 72 DEAN ST
LONDON W1 2 01-437 1222 (0330)

microserve™ a commitment to service MICROCOMPUTER SERVICE ENGINEERS

Microserve, the nationwide field service division of the Comart Group of Companies, has established service locations in Glasgow, Manchester, Birmingham, London, Cambridge and Southampton.

We are looking for experienced service engineers to strengthen our Microserve team in the Birmingham and London areas.

If you have a minimum of 5 years' experience in the electronics industry we would like to hear from you. We would expect you to be familiar with TTL, MSI and LSI Technologies with the ability to fault find complex logic to component level. Salary will be negotiable, dependent on experience and qualifications.

Please write or telephone for an application form to: Jane Hamilton, Comart Limited, Little End Road, Eaton Socon, St Neots, Cambs. Telephone Huntingdon (0480) 275005.

Member of the Comart group of companies (0336)

PROGRAMMING IN BRISTOL

£6K - £10K

SWALCAP is a small self-financing unit based at Bristol University providing online services at the 200 terminals of the seventeen member libraries. The existing network configuration involves a Xerox 630 and VAX 11/780 at the central site with a Computer Automation LSI 2/20 acting as a communications processor. Light pen units, vdu and printers in each of the libraries are linked via their own LSI 2/20 minicomputers and 2400 baud lines to the central site.

The Xerox 630 is being phased out with the development of new enhanced systems written largely in Fortran and running on the VAX computer under the VMS operating system and the Systems teleprocessing system, Systat. A second VAX will be installed later this year and plans are being made for the provision of more powerful DEC based configurations for the library sites.

Three additional programmers are now required to work on the next phase of this development. The posts will provide excellent opportunities for involvement in all aspects of transaction processing and associated batch systems with on-line program development using Fortran, Systat and assembler language.

The starting salary will be at an appropriate point, according to age, qualifications and experience, on the scale £8,070 to £10,675 (review outstanding).

For further details either ring or write to: Martin Hitchcock, SWALCAP, Willis Memorial Building, University of Bristol, Bristol BS8 1RJ. Telephone Bristol (0272) 277891. Letters of application must be sent to the director within fourteen days of the appearance of this advertisement. (0332)

BUSINESS OPPORTUNITY

Private company has an opportunity for an experienced SYSTEMS ANALYST/PROGRAMMER to set up and control a new consultancy bureau.

DEC PDP 11/03 system already installed in prime High Street location in SE London area with great potential.

Partnership/participation available for suitable applicant.

Please write to: Managing Director Delroy Ltd 59 Queensway Potts Wood Kent BR5 1EP (0324)

STAFFORDSHIRE EDUCATION COMMITTEE STAFFORD COLLEGE OF FURTHER EDUCATION

LECTURER I IN COMPUTING

£5,355 to £9,267 per annum

Application forms and further particulars are available from the Chief Administrative Officer, Stafford College of Further Education, Earl Street, Stafford ST16 2AR.

Applicants are asked to note that it is the County Council's view that it is desirable for their employees to be members of an appropriate Trade Union. (0313)

NEWCASTLE UPON TYNE POLYTECHNIC MANAGER

- MICROSYSTEMS CENTRE (2-year appointment)

The Department of Industry has made funds available to ensure that Microsystems Centres along the lines of the NCC Microsystems Centre of London, are available throughout the UK. This is to be effected by setting up a Federation of Microsystems Centres supported by the DOI and administered by the National Computing Centre. The DOI has approved the establishment of a Microsystems Centre at Newcastle upon Tyne Polytechnic as a member of the Federation which has the overall aim of providing an impartial service to the local business community in the selection and use of microcomputers.

Applications are invited for the post of Manager of the Microsystems Centre. This post is to be filled as soon as possible (a secondment would be considered).

Burnham FE PL: £11931-£13290 (bar)-£15018 per annum.
For further details and application form returnable by 19 August 1982, please call our 24-hour telephone answering service (0632 323128) or send a stamped addressed envelope to the Personnel Officer, Newcastle upon Tyne Polytechnic, Ellison Building, Ellison Place, Newcastle upon Tyne, NE1 8ST. (0338)

UNIVERSITY COLLEGE CARDIFF COMPUTING CENTRE

Applications are invited from graduates for the post of

COMPUTER OFFICER (MICROPROCESSOR SYSTEMS)

In the MICROPROCESSOR SUPPORT UNIT in the computing centre. The post carries responsibility for evaluation, interfacing, and the development of hardware, systems, and components and the supervision and use of the Unit's equipment. The person appointed will work with the microprocessor support officer and will be expected to liaise with microprocessor specialists at other locations and to maintain awareness of developments in the field.

Applicants should be graduates with a first class honours degree in hardware and/or software aspects of microprocessors, together with an ability to communicate with non-specialists.

The appointment will be for approximately three years from the date of commencement and will be on the scale OR 18 (£5,285-£8,926) or 1A (£6,070-£10,576). Duties to commence as soon as possible.

Applications (two copies), together with the names and addresses of 2 referees should be forwarded to the Vice Principal (Administration) and Registrar, University College, P.O. Box 78, Cardiff CF1 1XL, from whom further particulars may be obtained. Closing date 5th August 1982. Ref 2434. (0293)

PROGRAMMER

Post No. 777 Salary band R/MA - £7,875

The Centre operates an ICL 2960 Computer with 512K main memory, 1.8Gbps disc backing storage and a normal range of peripheral devices. The Centre is currently under development within the Computing Centre.

An ICL 2960 using MINIMAC provides a "BASIC" Service to both the Polytechnic and schools. A number of microcomputers are used within the Polytechnic, and local area networks are being developed based on these machines.

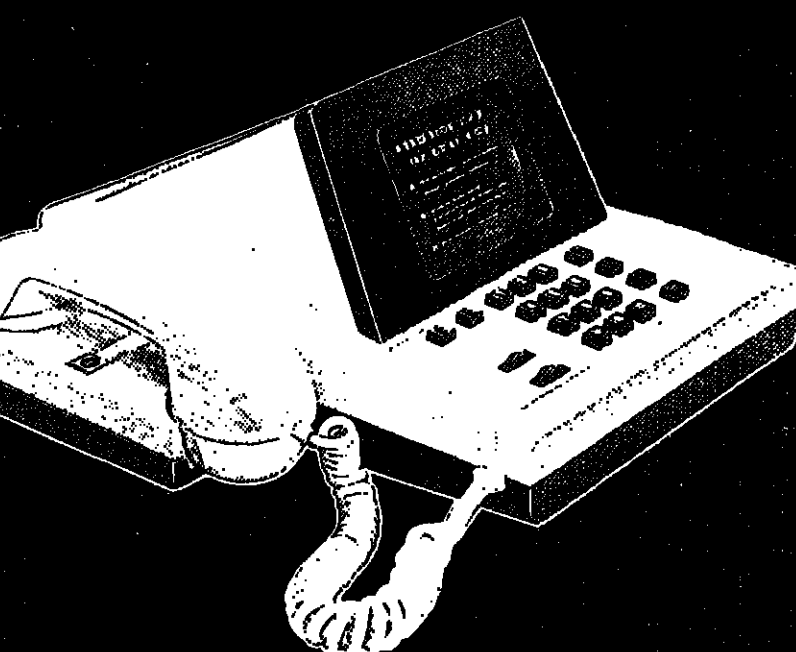
The person appointed will be expected to take a major share of the work of the Centre for the Central Administration. Applicants should be graduates with a first class honours degree in hardware and/or software aspects of microprocessors, together with an ability to communicate with non-specialists.

Applications forms and particulars from the Personnel Officer, Portsmouth Polytechnic, Four Mount, Hampshire Terrace, Portsmouth PO6 3LH and should be returned as soon as possible. (0203)

THE UNIVERSITY OF MANCHESTER APPLICATIONS PROGRAMMER

The Department of Astronomy is seeking a programmer to develop applications software for the SERC Starlink project. Starlink provides image and data processing facilities for the UK astronomical community. It is based on eight VAX-11 computer systems distributed throughout the UK and linked in a communications network. Each computer has extensive memory and storage resources, and high resolution colour image displays. The appointee will join a centrally coordinated but distributed team, working closely with and supporting the astronomers at the Manchester site.

Work will be oriented towards the astronomical interests of the Manchester users, with special emphasis on Radio Astronomy. Applicants should ideally have a degree in a numerate subject, at least two years' relevant computing experience, and a background in astronomy. Appointment is initially for two years. Salary range p.a.: £6,070-£10,675. Particulars of application forms (returnable by August 31st) from the Registrar, The University, Manchester M13 9PL. Quote ref. 04/82/CW. (0278)



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Join our advanced digital
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£7250 to £9,700 p.a. (dependent on experience)

Our engineering teams at Poole have a record of achievement in projects which are meeting today's demand for faster and more flexible telecommunications services. Their contribution to system X, the first fully electronic digital telephone switching system, is of particular significance.

Additional Engineers are now required for a number of development projects for both home and export markets. The work involves:-

- System requirements engineering
- Communication systems engineering
- Real Time software

If you have a graduate or equivalent background, at least two years' hardware or software experience and an interest in systems engineering, we have ideal opportunities for you.

You would be joining small teams of well qualified Engineers and have the assistance of all the latest facilities. Mobility between projects is encouraged ensuring maximum job interest and career progression to more senior hardware or software design activities.

We offer a very competitive salary and benefits package together with comprehensive relocation assistance to an attractive area of the Dorset Coast.

We also have opportunities for
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CWP/348 - QUICK RESPONSE COUPON -

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Carrying the flag for Britain's Computer Industry

FIELD SERVICE ENGINEERS & MANAGERS

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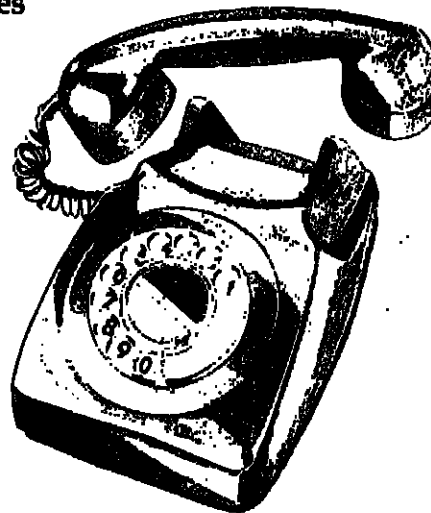
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Britain's largest and fastest growing manufacturer of interactive business systems requires the most efficient and experienced field engineers available. Also experienced managers for Area Control with both good technical and commercial skills and experience. The pay and benefits are excellent and the prospects for advancement are unequalled anywhere else in the industry. Systime's client base is expanding fast and men and women are required to join the Company's prime regions NOW. Engineers should have 3+ years relevant experience, ideally gained on DEC systems. Also ideally you will have worked your way through workshops and an apprenticeship to field engineering. Managers should have man-management experience and considerable ability to take commercial responsibilities relating to administration and profit achievement.

If you want to know more about these positions and would like an interview weekdays, evenings or weekends in your locality, don't delay, 'phone as soon as possible.

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18/78

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PROGRAMMERS to £9,500

Our client is a world leader in the development of advanced data communications technology using sophisticated distributed architecture.

The company is now expanding its software team at a pleasant West Country location. If you are that rare breed of software professional to whom high technology provides real excitement and challenge, these vacancies will appeal to you.

You will be working on new projects at the very forefront of communications technology, gaining invaluable skills in technically strenuous areas that will be most relevant in years to come.

These are genuine career opportunities working with both minis and micros, on projects small enough to avoid impersonality yet large enough to test you to the limit.

For Project Leaders, this represents the chance to carry a project from initial concept to final implementation, and to expand your supervisory role; while for Programmers it is an opportunity to advance your design skills.

Project Leaders must be graduate level, with at least four years' computing experience, including real time software design.

Programmers, also of graduate level, need at least two years' experience but a specific language is of secondary importance.

The rewards include a comprehensive range of benefits, together with a most generous relocation package where appropriate. The location offers a wide selection of reasonably-priced housing plus excellent leisure facilities.

Interested men or women should contact Patrick Convey, quoting Reference No. CW 307.

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CPC

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Our consultants, analysts and technicians, between them, account for over 150 years of experience in fields such as Life, Pensions, Unit Linked, Broker Service and Reassurance. Because of the continuing expansion of our client base we want to meet people who have the flexibility and experience necessary to become part of an exciting, growing company.

We would like to hear from you if you can meet any 3 of the following criteria:

- you have worked on — or managed — at least one major insurance implementation. Knowledge of Life Assurance or the London Market would be particularly desirable
- you have at least 5 years experience in data processing with a solid COBOL background
- you have a sound working knowledge of Texas Instruments 980 equipment
- you are capable of being promoted — within a short period — to Project Manager with full business responsibility for all aspects of a major project
- you enjoy working with small professional project teams who are frequently under pressure, and you have a Flexible attitude to your work

Other benefits include: Merit awards based on recognisable achievement, profit-related bonus, flexible working hours, non-contributory pension, BUPA, personal accident and health insurance, opportunities for overseas travel.

Please contact David Hendry at:

(0216)

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ROLFE & NOLAN COMPUTER SERVICES P.L.C.

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● 5x PDP 11/70 ● VAX 11/750 ● PDP 11/44 ● RSTS/E ● VMS ● RSX ● BASIC+/+2 ●

● 7 Mb of core ● 2500 Mb of on-line storage ● 2 computer centres in the City ● On-line to 100+ clients in 8 countries ●

Rolfe & Nolan Computer Services plc is one of the U.K.'s fastest growing timesharing bureaux — followers of the Stock Market will have noticed their share values very nearly double recently, after yet another record year.

Acknowledged leaders in the field of providing d.p. services to Commodity Brokers, they have also expanded into new applications areas and now offer a comprehensive range of commercial timesharing systems based on the latest DEC hardware and software, including:

commodity accounting; payroll; stock and production control; general accounting systems; financial modelling; word processing.

With further expansion planned, they now wish to appoint two experienced Programmer Analysts to become involved in all aspects of the design, development and implementation of complex interactive systems, liaising with and supporting the company's clients.

Two Senior Programmer Analysts
£10K — £12K

In addition to a high level of self-motivation, you should have:

- Sound academic qualifications
- At least 3 years' experience of DEC BASIC+ or BASIC+2
- In-depth knowledge of either RSTS, VMS or RSX
- Strong commercial applications experience

The company has much to offer — varied applications involvement, promotion and salary reviews strictly on merit, an informal but professional working environment and excellent prospects to move towards project leadership roles.

For a strictly confidential discussion on these opportunities, contact Barry Latchford on the number below by 9.30pm (STD 082572) 3197 after 7.30 p.m. Alternatively, write to us at advising consultants quoting ref. 387 and enclosing a brief career history.

Initial interviews will be conducted in London.

(0216)

Barry Latchford Associates

Blair House, 7 Hazelgrove Road, Haywards Heath, West Sussex RH16 3PH

Tel: (0444)

459815/67

John 11/15/82

Switzerland

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Senior Software Engineers/Software Engineers

An expanding sub division of an International Company specialising in Process Control for Power Station Computer Systems and Energy Management Control Systems seek additional Engineers for permanent careers on English speaking Projects in Switzerland.

The senior positions fall into four categories and candidates should have relevant experience to work on the following areas:

Quality Assurance

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- ★ Operating Systems
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Communications Networks

- ★ X25
- ★ Decnet
- ★ Systems Architecture

Power Applications Systems

- ★ Electric Network
- ★ Closed Loop Control
- ★ SCADA

Software Engineers; we are looking for candidates to concentrate on establishing new standard Software. Successful candidates should have most of the following experience: A degree, 3/5 years' Real Time experience, PASCAL, CORAL, Assembler, VAX 7/80, PDP11, VMS, RSX11M and Industrial Systems. CW28/1

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We have been retained by an international telecommunications company to recruit several SOFTWARE ENGINEERS to develop and implement software for a NEW PUBLIC DATA SWITCHING SYSTEM, involving working on Operating Systems, Diagnostics, Telex applications and X25 interfaces.

Candidates should have a degree, 18 months plus Assembler experience, preferably in a Telecommunications environment on minicomputers. An in-depth knowledge of Real Time Operating Systems would be advantageous.

Successful Candidates may look forward to enhancing their career prospects, gaining valuable experience in an international environment. CW28/2

Interviews will take place in London later this summer. For further details on the above two companies, conditions of employment and living in Switzerland. Please send C.V. or write for application form quoting the reference number.

APRIL Advertising

5 Brighton Road, Surbiton Surrey KT6 5LX

SALES BIT

Quality of Management — 19

High cost of a territory with no staff

IF "management by disaster" applies to any aspect of sales management, it is the recruiting of sales personnel. I would say that a good three-quarters of the demand we get at Sales and Marketing Recruiters is from sales managers who have an apparently sudden, immediate and desperately urgent need for salespeople that they had barely considered up to a few days before.

In some cases they are starting out on a new selling year or a special sales campaign on the assumption that all they have to do to obtain the required number of salespeople is to shove an advertisement in the paper or telephone a recruitment agency.

On the other hand, a salesman may have suddenly departed with questions of "Did he jump, or was he pushed?" piling into insignificance against the cost of having a territory with no staff and the length of time required to get a new recruit up to full steam.

One of the essential skills and responsibilities of sales management is the ability to anticipate recruitment needs in order to facilitate early action. While it is undeniable that salespeople can sometimes be a warning, the proportion of disasters can be seen well in advance of the event if only for reasons of inadequate performance.

Recruitment needs related to business expansion are clearly more predictable, yet remarkably this typically has little apparent effect on the ability of most sales managers to take action before the eleventh hour.

The cost of having an un-manned sales territory can be appallingly high and while there are no truly effective means of accurately assessing them, one can gain a notional appreciation related to the anticipated profits that might be gained from the employment of a successful salesman.

In the case of a computer manufacturer, an individual sales target of £50,000 would be a reasonable kind of figure, if not on the low side. If we assume a typical industry profit of 50% on selling price, then the cost of lost profits (conveniently ignoring the likely exponential growth of business for a new salesman) is about £20,000 a month.

That puts into better perspective the need for giving priority to recruitment and justifies the apparently high cost of using specialist recruitment agencies and the considerable expense of advertising.

Surprisingly, few sales managers have a real awareness of how long it takes to carry out a formal recruitment campaign and how long it takes to get a salesman up to steam once he joins the company. Having made the decision to recruit, many managers appear to expect people of the required calibre on board in a week or two, and revenue-earning soon after. This is a considerable illusion, for the reality can be enormously different.

I shall ignore the recruitment strategy of shopping around agencies on the off chance that they may have a few top-class salesmen around with nothing to do.

The establishment of an advertising-based campaign utilising the services of a specialist agency would involve a number of essential activities, each of which is likely to demand a significant amount of time:

PUZZLE ANSWER

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SMR

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We are seeking an experienced Manager with considerable field sales experience of Mini and/or Micro computers to establish a completely new sales operation dealing specifically with OEM Dealer outlets throughout the UK and operating from extensive offices in the

HOME COUNTIES

This will be a small but specialist operation with an anticipated complement of around 6 sales people within the initial period of development. This opportunity is therefore likely to suit applicants currently operating at Branch or Regional Sales Management level for a major manufacturer or in a sales management capacity for a senior Micro computer operation. Essential qualifications include the ability to recruit and motivate a dynamic and enthusiastic sales force, create an imaginative marketing strategy and formulate effective operational disciplines and policy.

Please provide complete career details to Peter Hubbard, Area Director, at the above address HSC1072

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After training, you will take over the management of one of our software applications. You will have considerable client liaison, and therefore be accustomed to dealing with directors and partners of significant organisations.

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For further information, please send a.c.v. in confidence to:

David Blecher
Managing Director
STAR COMPUTER GROUP PLC
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or ring for further details:
Tel: 01-788 7633

STAR

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in Accountants Systems

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MANAGER - NEW BUSINESS MINI/MICRO SYSTEMS

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A dramatic increase in recommendations to their clients has created the need to appoint an experienced salesman with a successful track record in large mini-based systems and a broad commercial knowledge to head up this new sector.

Potential directorship and equity participation.
For further information contact Brian Mawdaley or David Lloyd quoting Ref: CW/897.

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£7,600 to £8,140 (Salary under review)

We are looking to recruit an Operations Support Officer for our Computer Services Division.

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The post involves providing first line support to all production applications, it is therefore essential that a successful applicant has a working knowledge of SCL.

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Telephone 01-701 2870 any time for an application form, or write on a postcard to: The Personnel Officer, London Borough of Southwark, 25 Commercial Way, London SE5 8E 6DG. Please quote reference: CW/8/198 and job title. Last date for receipt of completed Application Forms: 5.8.82.